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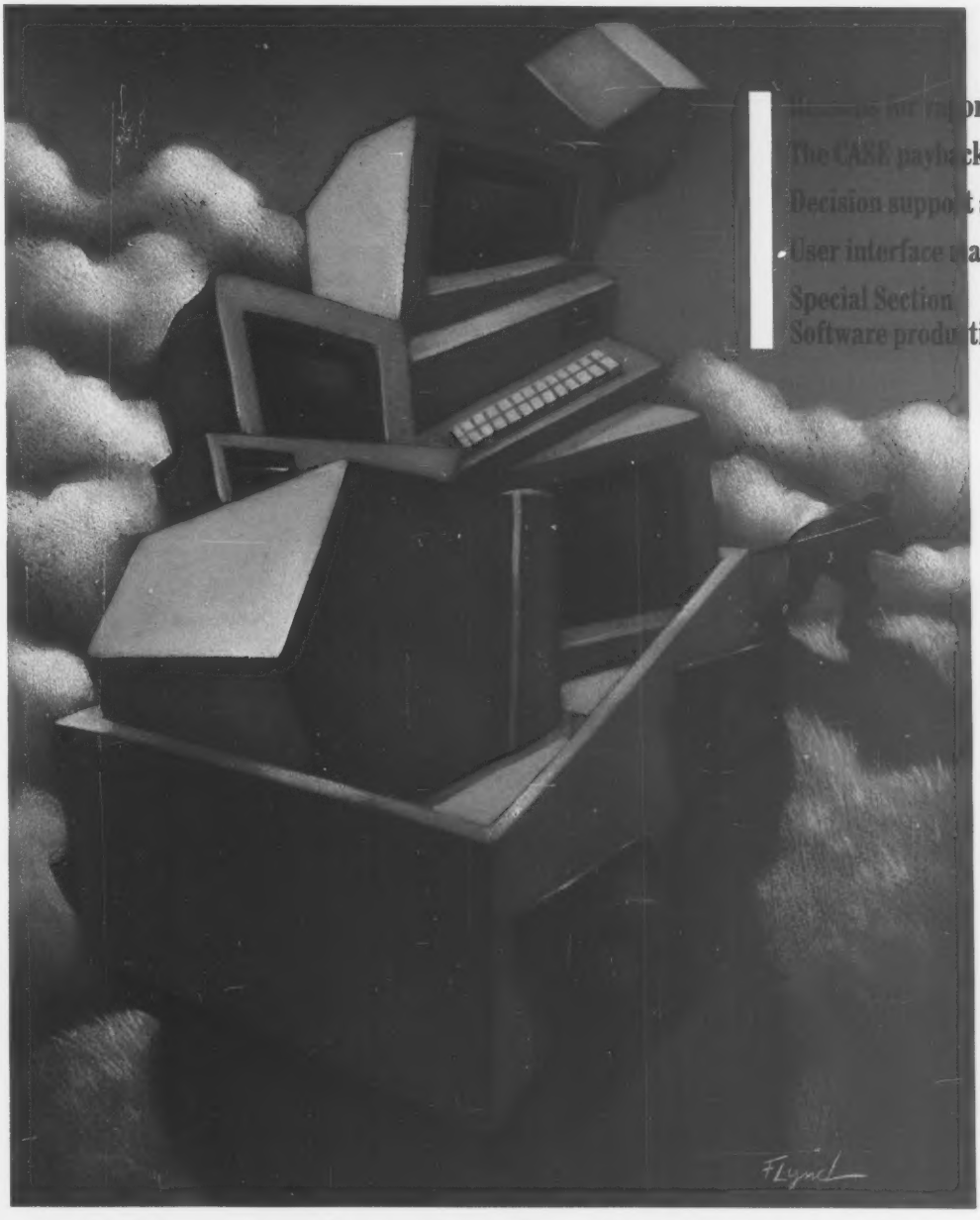

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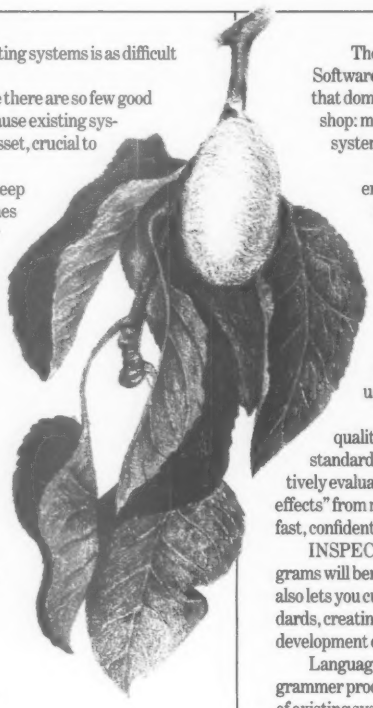

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in focus

LONG OVERDUE The problem of vaporware has become an epidemic. Announced products go undelivered. Promised applications never get produced. It's enough to make you tear your hair out. And this outbreak hasn't touched small firms alone; the disease has afflicted some software heavyweights as well (one patient's name begins with L). Why is this malady spreading? Our author investigates the reasons behind vaporware. By Avery Jenkins. *Page 10.*

THE CASE PAYBACK CASE will increase your programmer's productivity dramatically. CASE will decrease your applications backlog significantly. CASE will automate the software life cycle, shine your car, soothe your stomach and help you live longer. Separating myth from reality in the CASE market is hard to do. Be smart; CASE is not a cure-all but it can be a critical tool to help you put a dent in today's applications problems. By Martin B. Azarnoff. *Page 15.*

The DSS caper

By Helen Pike. On the trail of what constitutes a decision support system, our intrepid reporter encounters executive information systems, AI and a host of other options for the savvy business user. *Page 19.*

Electronic emancipation

By Evelyn W. Wilk. Free at last! User interface management systems liberate users from complex system procedures. No longer slaves to the machine, users can concentrate on using their desktop devices to support corporate goals. *Page 21.*

Measuring up benchmarks

By Helen Pike. Benchmarking has become a critical weapon in the fight for large-system hardware dollars. But the question remains whether benchmarks are a marketing gimmick or a valuable way to distinguish products. Benchmarking experts and customers evaluate their merit. *Page 27.*

What will standards bring?

By Philip J. Gill. Because a standardized computer world won't be in place for another 10 years or so, it's hard to imagine what it will be like. But with the help of some industry veterans, imagine we did. Life after standards will be interesting times indeed. *Page 38.*

COVER BY FRED LYNCH

SPECIAL SECTION

Software productivity

Hardware has a glamorous reputation. Turbocharged PCs likened to Porsches. Resource-guzzling minis and mainframes seen as the industry's Cadillacs. Meanwhile, software has lagged behind its flashier counterpart. But with the advent of innovative software technologies that solve today's sticky business problems, hardware, beware. Software is coming into its own. Section on page 31.

From the Editor

Including your letters to us. *Page 4.*

Manager's Corner

Jim Young advises MIS managers to take a proactive role in their companies. *Page 5.*

News & Analysis

The software development effort in Japan; resellers' MIS market pitch; telecommuting update; lights-out software. *Page 6.*

Products

Tech Talk on CASE in MIS; Oracle interface; project assessment and control software. *Page 41.*

Blue Beat

Brian Jeffery on what's missing in the PS/2 line. *Page 41.*

Calendar

Industry events. *Page 45.*

Commentary

A Boole & Babbage senior fellow compares the SAA phenomenon to the System 360. *Page 47.*

The Insider

Michael Millikin on CASE tools for users. *Page 48.*

Log Off

Results of the 1988 software industry salary survey by the Software Publishers Association. *Page 48.*

The powers that be on the future power in business software.

Successful analysts and consultants may not always see eye to eye, but they do have one thing in common: the power to spot business trends first.

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On customer satisfaction: "Strategic products are the key. In software, these are products that meet customers' current *and* future design and development needs. According to a recent IDC survey, one company is doing a remarkable job in customer satisfaction in this area—Cullinet."
—Tom Willmott

On potential pitfalls: "Distributed processing in a multi-vendor environment can result in huge potential problems in areas such as user interfaces, design complexities and the portability of applications. Cullinet's current products address these pitfalls, while raising the bar on sophistication and integrated functionality across platforms."
—Judith Hamilton

On the opportunities of tomorrow: "Opportunities in the software industry are expanding because of a glut of new technologies and the inability of old systems to work with them. Companies like Cullinet, that have invested heavily in products that run across multiple platforms, are the ones that will grow."
—Charlotte Walker

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Circle Reader Service Number 2

Text, graphical documentation at core of departmental growth

I was struck that the Aug. 3 issue of *Computerworld Focus* on "The triumph of integration" provided only a cursory treatment of document or data interchange standards vs. logical and physical interconnection standards. It is not that those aren't important — they are — but are insufficient by themselves.

Much of the growth in departmental processing and computer workstations is predicated on assisting professionals in automating their work and more effectively communicating the results of their work. This requires good old-fashioned documentation and, today, that means well-integrated multifont text and graphics in a defined style. Documentation and engineering drawing standards are being defined and implemented by the Department of Defense and are progressing rapidly enough to make the statement that IBM's Document Content Architecture/Document Composition Facility and other similar vendor attempts will be relegated to oblivion.

James W. Sole
Rockport, Mass.

IBM: Private EDI nets haven't cornered the market on speed

Michael Ball's Sept. 7 article, "EDI takes root," is a refreshingly candid perspective on electronic data interchange — a too often oversold and underdelivered technology. One observation: In discussing the vendors of EDI network services, Mr. Ball warns that "products from these companies are not as fast as a private EDI network and cannot offer real-time transfers." IBM Information Network (IBM IN) supports EDI for leased-line computers at speeds up to 56K bit/sec. A continuous receive option — implemented, for example, in IBM IN's Expedite/CICS offering — makes possible the kind of real-time EDI communications so critical to the competitive just-in-time applications Mr. Ball describes.

LETTERS TO THE EDITOR

Ann S. Boland
EDI Services
IBM Information Network

EDITORIAL COMMENTARY

People who don't integrate drive Edsels, wear leisure suits

Everybody's doing it. So much so that DEC felt a need to come out at Decworld in Cannes, France, and formally announce it was also doing it, although in reality it had been doing it for awhile. Control Data is doing it. So is Unisys. So is TPW. And now so is IBM, although Big Blue claims it has been doing it forever.

One of the big issues in the computer industry centers on systems integration built with local-area networks and other networking schemes. Failing to classify yourself as a systems integrator in 1989 is going to be like saying you're still hoping Ford will bring back the Edsel. Out of it. Gone.

In the meantime, DEC and IBM have seen the likes of TRW and Unisys winning more systems integration contracts in the government and private sector.

DEC had no choice but to move quickly and join the public relations fray. At Cannes, DEC formally announced something that it thought was already clear to everyone else: It is a major player in systems integration. Everybody's doing it.

FROM THE EDITOR

Jack of all trades

As an MIS professional, your role is being re-examined, redefined and restructured within your organization. Whether it's top management looking at cost-justifying your proposals or end users attempting to circumvent you, MIS is under siege. How successful will these changes be? Only time will tell. How can you remain in charge? By being an innovator rather than waiting for events to control you.

Organizations themselves are being restructured at every level. Technology is helping to push through these changes as well as being propelled by them. Work group computing, for instance, which alleviates much of the bureaucratic and top-down decision making in organizations, also puts the ability to make informed decisions into the hands of new groups of users. Both the computing technology and the organizational restructuring of the way work is done are emerging simultaneously.

Software has long been the whipping boy of the industry and is often cited as the reason technology hasn't been more effective in increasing productivity. That may be about to change. Software technology may be on the brink of exploding into new forms and uses for whole new groups of workers. In this issue we examine some of these innovations in technology and products as well as some of the factors hindering renewed growth.

Automating the data center is going to be a major factor in software productivity. As the concept of lights-out data centers takes hold (see page 8 in our News & Analysis section) and the technology advances, MIS will have more time to act as an advisor rather than merely as an implementor. In the story "Software's driving force," Senior Editor Stan Kolodziej examines some of these developing technologies and what they will mean for MIS and the nature of productivity in America's corporations.

These and other emerging software technologies will assist MIS in the task of strategically distributing resources to departments or key personnel while maintaining overall control. The MIS professional's new role will encompass consultant, resource manager, strategist, politician, evaluator as well as purchaser, implementor and service and support provider. Pick one or all of the above.

Ann Dooley

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MANAGER'S CORNER

Seeing the forest for the trees

Jim Young

I am struck by the increasing frequency with which MIS managers are admonished to take a proactive role in their companies. Whether the message is about strategic planning, the technical architecture for the future or competitive systems, the theme is the same — take more initiative at a higher level for greater results.

Because I am one who has been guilty of pressing this point home, I feel obligated to explain why this important message is having so little impact in so many companies.

MIS leadership has some firm obstacles to its effective use. One is the lack of receptivity on the part of senior management.

When company executives decide that MIS issues are not among the most important determinants for a successful future, the MIS manager has lost the leadership battle before it begins. Even here, MIS managers should test the waters to make sure that executives are indeed disinterested. Too often, MIS managers remain passive based on an erroneous assumption that top management views MIS as an operational utility.

These executives may just need to be convinced of the potential benefits by the MIS manager.

Another reason MIS may stay out of the leadership business is that it is occasionally inappropriate. It may be heresy to admit this, but in some companies, MIS is simply not the right path to success. There are plenty of critical success factors that have nothing to do with MIS. In very small environments and for sellers of creative services and organizations dominated by legal, resource, personnel or other issues, MIS leadership may not only be ineffective but might get in the way of more appropriate solutions.

By far the most common reason for an absence of this kind of leadership in MIS is that the MIS manager simply has not fulfilled his high-level obligation. In defense of the typical MIS manager, this situation occurs all too often because of the simple inability to focus on a mission agreed to be important.

This category covers a litany of reasons to which the MIS manager holds the key. MIS managers can get submerged in day-to-day events in a way that impairs long-range decision making. A balanced sense of risk is destroyed as is the ability to properly distribute limited resources between tasks that handle today's activities and those that prepare for tomorrow's.

This kind of work environment limits the MIS manager in the following ways:

- **Time.** Day-to-day problems can monopolize all available time and push other activities from the MIS manager's agenda. The more rushed and harried the pace, the less tolerant the schedule becomes toward inclusion of longer range issues. Problems are ranked by how long they have been around, not by the seriousness of their impact.

The more receptive the MIS manager becomes to accepting problem-solving responsibilities, the more problems tend to gravitate to the manager.

- **Mentality.** A more serious side effect of a frenetic climate is the resulting distortion of the MIS manager's perspective.

Long-range decisions that are necessarily made will suffer from an imbalance in judgment. Assigning a false sense of importance to all urgent issues and procrastinating on more profound opportunities are notable deficiencies. Likewise, an overdependence on stability and avoidance of all fundamental change tends to develop.

These characteristics are eventually accompanied by a tendency to define opportunities in very restricted, localized terms while minimizing important business impacts. The more crisis-oriented the MIS manager is, the more pronounced this myopia tends to be. The skills of extension and projection that may once have existed become dormant and eventually atrophy.

- **Knowledge.** Even when time is available and the perspective broad enough, the MIS manager must have a repository of facts to draw upon to make decisions and recommendations that are both reasonable and appropriate. While many strategic solutions must be innovative, only if the selection is made against the context of experience is the decision likely to be a wise choice.

This may mean knowing what technology is available, will be available or can be integrated. It can also mean knowing the business the MIS manager is in, the marketplace, the key elements of the value chain and how the industry works. Some of the most effective competitive uses of technology have applied known and accepted technology to a new industry application.

MIS managers must arm themselves with appropriate knowledge to lead in the proper direction.

Saying that these elements are needed is fine but achieving them takes demonstrative, specific action. The following are some steps MIS managers can take to develop their leadership role:

- **Back away from details.** Many problems do not need all the attention that MIS managers give them. In fact, other DP professionals may be capable of dealing with some problems more effectively. Not searching out problems in the first place may be a good place for some MIS managers to start.

The next step is not to be dragged into problem management. To accomplish this, MIS managers may have to move to be out of the range of immediate problems.

- **Give problems to others.** Where the problems are serious and not contrived, they must be dealt with. The MIS manager should structure jobs so that others have designated responsibilities for initial problem confrontation. The MIS manager can develop the skills of subordinates to handle problems. Procedures through which to pass the problem to the MIS manager should be clearly established, even if only in the mind of the MIS manager. Without the need to nurse the immediate issue along, the MIS manager can pay attention to future opportunities.
- **Begin activities that focus on the future.** One role of the MIS manager is as the "booking agent" of the MIS department. Time should be spent on activities that will lead to future projects and programs. MIS or corporate planning should be conducted and followed up with regularity. Time should be spent with senior management and key users exploring opportunities for new uses of technology as well as how to make existing uses work better.

Problems should be understood in order to achieve permanent solutions, not emergency fixes.

Some environments are not ready to undertake new projects, yet progressive MIS management is still needed to obtain funding and gain support for other modifications. Without the proper leadership at the right levels, the MIS department will be condemned to remain in a remedial and possibly ineffective position.

- **Provocative education.** The MIS manager must devote time to those activities that inspire new ideas. Trade shows, seminars and professional activities all give the opportunity to learn what others are doing. Industry groups, site visits and professional readings can alert MIS to the activities of others. Vendors are helpful in keeping the MIS manager abreast of what is happening in new technology and its application.

Such information should be shared with others within the company and compared with the needs of the company as stated in plan documents or just considered for use in general. Many of the best ideas are those whose use was not anticipated.

The opportunities for MIS managers to improve the uses of technology within their companies are great. However, doing something about the situation is neither easy nor obvious.

To take a progressive leadership role, the MIS manager must work hard to make time available, maintain a constructive high-level perspective and build adequate background knowledge. Only when MIS stops chopping down trees can it effectively decide how to deal with the whole forest.

Young is managing director of MIS for the Wheeler Group, a division of Pitney Bowes, Inc. in Hartford, Conn.

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news & analysis

UPDATE

Waiting for Dbase IV

Last week, users waiting for Ashton-Tate Corp.'s Dbase IV release, an upgrade that features SQL and relational capabilities, probably could have been found clustered around the mail room or waiting by their phones to find out if the Torrance, Calif., company did indeed ship the overdue software package. Still waiting are those users who want Lotus Development Corp.'s Release 3.0 of 1-2-3. Either it will come in time for Christmas or else it will be a New Year's resolution.

On the prowl for software companies or tools to buy

It might not yet be a stampede, but momentum is picking up as more companies cut deals to jointly market software or to buy outright software companies whose offerings fit within their own product lineup.

Unisys Corp. in Blue Bell, Pa., will be getting financial, database and graphics software rewritten for its computers from the vast library held by Garden City, N.Y.-based Computer Associates International, Inc.

In exchange, Unisys will market CA's software, which can already run off Unisys' hardware without having to be recoded. In addition, Unisys added to its Unix hardware line by agreeing to acquire Convergent, Inc. in San Jose, Calif., a Unix-based hardware vendor, for $332 million.

Xerox Corp. will acquire Crowntek's Cambridge, Mass.-based subsidiary, Advanced Information Technology, which specializes in the research and development of database software systems.

On the prowl for software acquisitions is David L. Chapman, previously with Cullinet Software, Inc., now with Computer Power Group, USA, in Framingham, Mass. Working for this U.S. subsidiary of an Australia-based services and software company, Chapman is expected to scope out possible software acquisitions in his new role as president and chief executive.

Also expecting to make software acquisitions is Cambridge-based Lotus Development Corp., which in mid-summer hired Bruce Johnston, a former Wall Street software analyst for First Boston Corp. in New York, to head up the effort. And if you put your ear to the ground, you may have also heard of a possible $20 million wallet being carried by Motorola, Inc. for the purpose of software purchases and Comdisco, Inc.'s $120 million purse for buying personal computer language software companies.

Seal of approval: X/Open brand marks compliance

If you carry the Brand X seal, you're in. X/Open, the London-based consortium of computer vendors promoting a common applications environment, has announced a daunting series of tests through which software and hardware vendors can verify whether their products conform with X/Open specifications.

Calling it a "branding" program, X/Open's current release of the verification tests are built around compliance with the *X/Open Portability Guide 2*, amounting to a total of 3,745 tests.

That's not the end of it. With the *X/Open Portability Guide 3* scheduled for release in the fourth quarter of 1988, the number of tests will be bumped to 4,200.

The Esperanto of operating systems?

Could there be a Unix rapprochement?

Although it's too soon to call for a final analysis on just what makes up a true open Unix standard, the ongoing talks between AT&T and the Open Software Foundation (OSF) may blur further whatever distinctions initially had separated them.

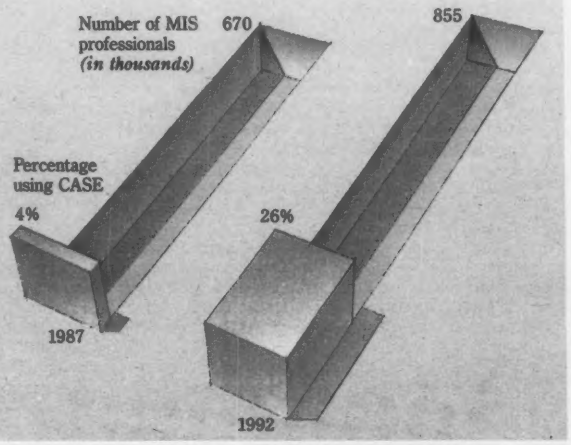
The official line from both camps is that "relations remain cordial" and that AT&T still has no intentions of joining the OSF. For its part, the Cambridge, Mass.-based group is going ahead with plans to design a Unix graphical user interface and an operating system foundation based on IBM's proprietary AIX kernel.

Of the 80 or so employees on

Continued on page 9

CASE in point

Estimates of CASE market penetration in the MIS arena



INFORMATION PROVIDED BY THE YANKEE GROUP. THE CASE FIGURES WERE ARRIVED AT THROUGH QUALITATIVE AND SAMPLED ANALYSES OF NORTH AMERICAN USER SITES AND SOFTWARE VENDORS.

GRAPHIC BY BRUCE SANDERS

INTERNATIONAL MARKETPLACE

Software effort in Japan lags behind that of U.S.

So close and yet so far. That statement neatly sums up the status of software in Japan, from both an import and export viewpoint.

The Japanese software development effort — particularly at the low end — is proceeding at a slow pace, according to Yugi Ogino, an analyst with International Data Corp.'s Japan market research subsidiary, located in Tokyo. Japanese software development "is still weak because people still don't like to pay for the intangibles," Ogino says.

Japan's Fifth Generation Language Project and its Sigma Project, whose goal is to enhance the productivity of Unix software developers by building up a database of modular designs that third-party developers can access through terminals, is still in the basic research stage, Ogino explains. "It'll be another several years to build the database," he says.

Regardless of the lag time, though, the software market in Japan is changing.

"New applications are requiring more sophisticated software," Ogino observes, "and hardware costs are nose-diving, so vendors are looking for new markets." He predicts software developer tools will be a big market in his country.

"The sale of packaged software is increasing because there's a software engineering shortage here," he adds.

According to IDC Japan figures for 1987, 85%, or $7 billion, of total software revenue came from customized software, while 15%, or $1.3 billion, came from packaged software.

Continued on page 7

Read about the sorry state of telecommuting today. Page 8.

BEST COPY AVAILABLE

Resellers spruce up MIS market pitch

Information managers are going to need more intermediary support in evaluating hardware and software and will be seeking service over price, according to industry watchers. Many software retailers and resellers see this as a demand they can meet in the coming months and, therefore, are gearing up their efforts in the MIS market.

"The world is getting extremely complicated," observes Mort Rosenthal, chairman and chief executive of Corporate Software, Inc., a reseller of personal computers and related software located in Westwood, Mass. "There's a profusion of communications, departmental systems, local-area networks [and IBM's] OS/2. They all create a lot of excitement, but they also create a lot of work."

And a lot of revenue. For example, sales and service to the Fortune 1,000 and 2,000 markets of products related to Unix and to Apple Computer, Inc.'s Macintosh, which is making headway into corporate America, are expected to create extra revenue for resellers and retailers.

Evolving role

As Nancy McSharry, a senior personal computer analyst at International Data Corp., a market research firm in Framingham, Mass., sees it, resellers and retailers will grow in their roles as consultants to departmental-level information users, helping them to evaluate and make the right purchase.

"The typical PC user is more educated than he or she was five years ago," McSharry says about users' ability to articulate basic computing needs. "In half an hour, they can get a gut-level understanding of how a product works."

She adds that it will still be cheaper for a software vendor to go through the retail or reseller distribution channel than to mount an expensive direct sales pitch. — HELEN PIKE

Japan

Continued from page 6

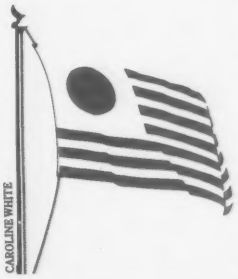
The best-selling U.S. imports are Lotus Development Corp.'s 1-2-3, followed by Ashton-Tate's Dbase II and Dbase III, Ogino says, while Japan "has nothing exportable except for games software."

Being the second largest software market after the U.S. on a per-country basis makes Japan a potentially lucrative arena, especially when it comes to personal computer software, says Heidi Hijikata, an economist with the U.S. Commerce Department in Washington, D.C., who is getting ready to release a study on the Japanese software market.

But the tradition of customizing software at each company and the intricacies of the Kanji alphabet make it a tough market to enter, she adds, pointing out that it takes two bits to translate one Kanji character.

However, at least one U.S. software company official says she believes there will be a boom period in the next two to three years for selling U.S. software in Japan as personal computers reach critical mass.

"Part of what has held back business software is [that] PCs aren't well established in the Japanese business place," observes Susan Whitford, executive vice-president of Persoft, Inc. in Madison, Wis., a company that makes Digital Equipment Corp. VT240 terminal emulation packages and IZE, a text-management program for MIS.



CAROLINE WHITE

Somewhere between the Japanese manager's growing understanding of the role PCs play in the marketplace and the increasing ease-of-use features of PCs lies the critical playing field for U.S. software companies, Whitford says.

And there's already competition going on. "The Japanese are competing [with the U.S] in the database arena and are quite established with their own mainframe software," she claims, having recently returned from a fact-finding trip to Japan sponsored by the Software Publishers Association [SPA] for its member companies.

The trip, according to Whitford, was "for an exchange of ideas. [The SPA] recognizes there is a global developers movement under way and that it's better to embrace rather than run from it."

What Whitford saw in Japan was "dynamite stuff. The graphics software is phenomenal. They're moving graphics in a way the U.S. companies aren't."

In particular, one Japanese word processing package that was running off a high-end NEC Corp. micro caught Whitford's eye, because it "made use of seemingly unrelated images.

"It was literally a picture from a VCR tape being used as an address file," she says, elaborating that text was wrapped around a picture taken from a video disk. "It was a Rolodex-type application into which sound could be integrated by clicking on icons. It was a mishmash of really great ideas."

The catch, Whitford says, is the business community may not "be able to get a handle on its possible uses." — HELEN PIKE

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Telecommuting drive stalls in large companies

In 1984 and 1985, it seemed like the time for telecommuting had come. Gasoline was expensive, the cost of urban office space was skyrocketing and the personal computer was becoming a relatively cheap and widespread commodity.

U.S. corporations had the reasons (and the computer tools) to let their employees work from home. It seemed that telecommuting was ready to take off.

However, telecommuting has stalled, at least in larger corporations.

Small gains

Tom Miller, director of research for the National Work-At-Home Survey by Link Resources Corp., a New York research company, estimates there are approximately 5.1 million U.S. corporations currently offering their employees some kind of work-at-home program, up from 4.9 million in 1987. However, the majority of such firms are smaller outfits, Miller says, and the majority of such programs only involve part-time work and affect a small number of employees.

Miller, who has been tracking the telecommuting field for a number of years, concedes that "the formal telecommuting trend has not moved far.

"Small businesses have adopted telecommuting more [readily than large organizations] because they cannot pay for the high costs of commercial real estate and because it's a way of keeping [employee] salaries low," Miller explains.

Why has telecommuting not caught on at larger companies? For Dennis Conley, information center consultant at Borg-Warner Chemicals, Inc. in Parkersburg, W. Va., it's a case of out of sight, out of mind.

"People still want to be as visible as possible in companies," Conley says. "If you're gone a lot of the time telecommuting, come promotion time, you're probably not going to be in the running. People get promotions because they're someplace at the right time and have done the right job."

Conley also reasons that gas is still relatively cheap, and many companies are now moving their headquarters to less congested and less expensive suburban areas to provide easier commuting for employees, undercutting some of the economic factors traditionally given in telecommuting's favor.

No incentive

Conley says Borg-Warner, which manufactures chemical and plastics products, does not have a formal telecommuting program nor does it have any current plans to initiate one, but it does have 12 employees that do some work from home. The employees using company-supplied personal computers at home are using them as an extension of their regular full-time shifts at the office, Conley explains. The fact that employees are not compensated for this optional work may help explain why the number of participating employees has remained static at a dozen for the past 2½ years.

Peter K. Dallow, director of the information center for the city of Fort Collins, Colo., also declines to call telecommuting at his office a formal program.

"We use telecommuting," Dallow explains, "as a flex-time option. We encourage it, but we don't measure it. In some cases, we've provided computers to employees at home, and they supplement their office work at home. In other cases, we have employees who work full-time from home.

"We encourage departmental managers and employees to consider telecommuting as an option where it makes sense for their jobs. What we don't do is enforce it or keep track of how many employees are involved. I guess you could say we're laid back about it."

Dallow agrees with Miller, however, on the benefits derived from telecommuting.

"Figures show that telecommuting employees can work harder and be more productive and that telecommuting can provide good retention and recruiting factors when hiring new employees," Miller says.

That might be true, but corporate America doesn't seem to be convinced. In the meantime, Miller says, much of his research is centered on the real action now — teleworking. Teleworking is the automation of the cottage industry movement, which has more professionals starting their own businesses at home. Part of the requisite trappings of teleworking include PCs, modems, portable facsimile machines and copiers. — STAN KOLODZIEJ

"There's no one here but us software programs"

Lights-out software gives rise to the unattended data center

Lights-out software, a euphemism for unattended data center operations software, is slowly creeping into the terminology of the computer marketplace.

"Lights-out software refers to a dark data center, where euphemistically the lights are out, and that means they're operatorless," explains Jeff Schulman, a program director at the Gartner Group, Inc., a Stamford, Conn., research organization.

Computers, Schulman says, have become harder to operate, putting pressure on the data center and data center operators to run more functions concurrently.

To err is human

"The problem is there has been no set of tools for operators to allow them to process concurrently," Schulman says. "We have statistics from IBM that indicate that 40% of all computer errors are due to operator errors. That's a very high number, and it's becoming harder to tolerate such outages because more users are online to the data center."

A big data center culprit, Schulman says, is the increasing number of systems monitoring and control messages that data center computers have to handle.

"Most mainframe operating systems, such as [IBM's] MVS, are very chatty and deluge operators with needless and meaningless information," he explains. "Most of the time the operator simply cannot do anything about it."

Enter the first stage of lights-out software: the suppression of computer console messages.

Schulman says that in his research he has seen "aggressive" users of first-wave lights-out software — such as CA-Opera from Computer Associates International, Inc., Netview from IBM, Netmaster from Cincom Systems, Inc. and Automate MVS from Duquesne Systems, Inc. — notch up to a 70% reduction in their console message traffic, freeing up CPU time and also cutting back on the number of operators needed. Operators can then focus on more important messages.

The second stage of lights-out software is message response automation, he says.

"For example, if there's a message that says there's some trouble somewhere or a message indicates a job has abended improperly, then an operator will want to catalog a procedure that will respond to that message, taking away the necessity of an operator responding," Schulman says, adding that most of the data center software market has reached this second stage.

He says that the third and final stage, however, is still several years away. That logical extension would be integrating and monitoring systems management tools such as disk management, job management, security, tape management and so on from one location. The ultimate goal? Dark data centers, with no human intervention whatsoever.

Certain reservations

Not everyone is sure about lights-out software, however. Jay Greenwald, product manager at VM Software, Inc., a Reston, Va., maker of VM Center II systems utility software, says lights-out offerings may be more a repackaging job of existing products than the advent of a new technology.

"Yet I think that what is referred to as lights-out software is still a step past any software existing today and anything a single operating system can do, but [full-fledged] lights-out software won't be around for four or five years yet," Greenwald says.

"I also agree there's a big market for it. Systems programmers and operators are very difficult resources to keep, very much in demand and are highly paid," he notes. "There's a huge investment in hardware and software out there, and anything you can do to keep it operational is going to be important."

An IBM thing

According to Schulman, lights out belongs almost exclusively to the world of IBM customers.

He explains that there are fewer such data center concerns in the Digital Equipment Corp. VMS world, for example.

"It's mostly an endemic IBM problem, mainly because of the way IBM's operating systems and subsystems have evolved, which is very haphazard, not together. There's lots of room for improvement here." — STAN KOLODZIEJ

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By Rich Tennant
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Update

Continued from page 6

the OSF payroll, about 50% are involved in design work, an OSF spokesman claims. About 5% are involved in the OSF's Research Institute, a design outreach to universities, while the remaining 45% are involved in strategic relations such as marketing and public relations, he adds. By this time next year, the OSF says it hopes to license Release 1.0 of its Unix version.

Should there be any features AT&T would find appropriate for its Unix System V release, the company will buy a license from the OSF, according to William Klinger, manager of the Unix Product Management Division within AT&T's Data System Group in Summit, N.J.

"To the extent it has a common value, AT&T will do it," Klinger says, referring to AT&T's possible future licensing of the OSF Unix. And, conversely, AT&T will seek OSF input beginning with Release 4.0 of its Unix System V version, he adds.

"We're not trying to have a closed shop," Klinger says about inviting industry input into future releases of System V at its Menlo Park, Calif., development facility.

For its part, AT&T continues to roll along with Sun Microsystems, Inc. in hosting a string of Unix software developer conferences. These meetings continue this month in London and Tokyo and in November in Boston and Chicago.

Bell South expects to be first phone company with gateway to databases

Bell South Corp., headquartered in Atlanta, expects to be the first regional telephone operating company to offer a gateway to databases. Contracts with 18 different information providers have been signed for such services as electronic mailboxes, news retrieval, airline schedules and hotel reservations, theater ticket availability, financial markets data, health tips and a shopping guide. Users will pay $3 an hour during the day and $1.20 per kilosegment, or 64K bytes of data. That figure comes out to approximately 20 typewritten pages.

Software-hungry CA swallows ADR, contemplates other morsels

A year after swallowing Uccel Corp. for $800 million, software giant Computer Associates International, Inc. in Garden City, N.Y., snapped up Applied Data Research, Inc., the systems software subsidiary of Ameritech, for $170 million last month.

Other menu items contemplated by the acquisitive Charles B. Wang, CA's chairman and chief executive, were Management Science America, Inc., Culinet Software, Inc. and McCormack & Dodge Corp.

Xerox AI spin-off targets engineers with user interface for Sun-3 unit

Xerox Corp. has done it again. In late August, the company spun out its artificial intelligence systems business unit as Envos Corp., an independent, employee-owned company in Mountain View, Calif. Envos has a two-year renewable agreement with Xerox's Palo Alto Research Center (PARC) that enables Envos to incorporate PARC's advanced programming technologies into its products. Roger G. McKee is chief executive.

Envos' charter is to develop and market software development tools for engineers who design complex software applications. Envos will also market advanced applications for the industrial and business environment and will act as a consultant to software engineering departments. It also will sell and support Xerox 1186 AI workstations.

Among its first products is Rooms, a user interface for Sun Microsystems, Inc.'s Sun-3 workstations that allows the user to create a set of organized, customized work spaces for each task. Each "room" contains a number of windows related to the task. Rooms is an extension of the Envos Software Development Environment, an advanced programming environment for LISP applications. Rooms costs $2,995 for a single license.

In March, Xerox spun off Parcplace Systems, Inc., based in Palo Alto, Calif., whose first product was Smalltalk, a programming language for creating easy-to-use software.

H & R Block taxes wallet with $36.7 million purchase of Access

H & R Block in Kansas City, Mo., the country's largest income tax preparation service, has bought Access Technology, Inc. in South Natick, Mass., for $36.7 million. Access, which makes spreadsheet modeling software for use in departmental computing, earned $2.49 million on revenue of $18.3 million for its fiscal year that ended April 30. Access will be placed within the Software Products Division of Compuserve, Inc., a wholly owned subsidiary of H & R Block located in Columbus, Ohio. It is expected that the merger will provide Access with financial backing to acquire further software products.

Sun, Schlumberger Technology extend AI product development partnership

Mountain View, Calif.-based Sun Microsystems, Inc. and Schlumberger Technology, Research and Development, Inc. in Palo Alto, Calif., are extending a joint development partnership for certain AI software products. The year-old program has already resulted in Sun's Symbolic Programming Environment (SPE), a development tool for Sun Common Lisp. SPE uses AI and object-oriented programming technology licensed from Schlumberger. In addition, Sun has recently acquired the right to Schlumberger's LISP window tool kit technology that it plans to incorporate in future Sun Common Lisp releases.

Integrated manufacturing the focus of institute's seminar program

Later this month, from Oct. 18-20, and then again from Dec. 6-8, the Industrial Technology Institute will hold three-day seminars on the planning and analysis of investments in integrated manufacturing at its Ann Arbor, Mich., facility.

Working in teams, participants will use software tools to assist in strategic planning of investments, examining the effects of different technologies and evaluating shop floor options. Specific software tools will be used for manufacturing systems modeling, economic translation of manufacturing performance, decision analysis and financial analysis.

The institute was established by the state of Michigan in 1982 as a nonprofit center of excellence to improve the productivity and competitiveness of the U.S. durable goods manufacturing industry.

Release 3.2 said to bring AT&T closer to uniting Unix derivatives

Calling all Unix aficionados! Unix System V/386, Release 3.2, which includes features from Microsoft Corp.'s Xenix operating system, is now available, according to AT&T's Data Systems Group, based in Morristown, N.J.

With Release 3.2, machines based on Intel Corp.'s 80386 microprocessor can run either Unix System V or Xenix System V applications written for Intel 80286- or 80386-based machines. When combined with available companion products such as Phoenix Technologies Ltd.'s VP/IX or AT&T's Simul-Task, Unix System V/386 can also run personal computer applications.

Version 3.2 also includes networking features such as AT&T's Streams, a Unix enhancement that enables programmers to write communications protocols more easily, and the company's Remote File System.

Furthermore, Release 3.2 represents a key step in AT&T's effort to unify the major derivatives of the Unix operating system, the company claims. Release 4.0, anticipated in mid-1989, is expected to merge the features of Unix System V, Xenix and University of California at Berkeley Unix 4.2 in one product.

Control out of chaos: Interface seeks 286/386 program cooperation

Six personal computer hardware and software firms are sponsoring a software interface aimed at avoiding conflicts between Intel Corp. 80286- and 80386-specific software. The specification is called the Virtual Control Program Interface (VCPI). It was designed to permit cooperation between 386 control programs, which use the Virtual 8086 mode of the 386, and application programs, which execute in 286 or 386 protected mode.

The VCPI specification addresses technical issues between control programs and runtime environments that arise due to the nature of the 386 microprocessor. These conflicts include CPU mode switching, hardware interrupt processing and sharing extended memory.

The original VCPI specification was developed in 1987 under a joint development agreement between Phar Lap Software, Inc. in Cambridge, Mass., and Quarterdeck Office Systems Co. in Santa Monica, Calif. The other sponsors are A. I. Architects, Inc. in Cambridge, Quadram Corp. in Norcross, Ga., Qualitas, Inc. in Bethesda, Md., and Rational Systems, Inc. in Natick, Mass.

VCPI specs can be obtained from Phar Lap. — HELEN PIKE

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Long overdue

The reasons behind vaporware

BY AVERY JENKINS

CHUCK LADOUCEUR

Even though the problem of vaporware has existed almost as long as computers have, the past year has seen a new and virulent outbreak of this industry's version of the common cold.

And the most recent round of vaporware has been all that more visible because it has hit several of the personal computer software heavyweights.

Vaporware is the term for software announced long before its ship date, which is then repeatedly pushed back as developers struggle to get a usable product out the door. And, in some cases, the product never debuts at all.

Users groups have begun to react strongly to the incidence of vaporware. For example, the Philadelphia Area Computer Society will no longer permit companies to demonstrate products to its 1,000-plus membership unless that product is currently being shipped.

But vaporware does not affect only the public market. In-house software development suffers from many of the same problems; MIS managers are familiar with the struggle to meet users' needs in a reasonable period of time with limited resources.

PC VAPORWARE

Perhaps the most famous example of vaporware in the PC industry is Ovation from now-defunct Ovation Technologies. Ovation was an integrated package that in late 1984 and early 1985 received the acclaim of reviewers, excited anticipation on the part of users and even rated a cover story in an industry publication.

In fact, however, Ovation was a triumph of public relations over reality. The package was said to never have existed except as a demonstration front-end that lacked most of the intended features.

Wary and wiser

Although Ovation taught the PC community to be a little more cautious about vendor claims, few expected the problem to extend to such well-established firms as Ashton-Tate Corp. or Lotus Development Corp. Ashton-Tate's Dbase IV has been announced, written about, demonstrated to users and undergone just about every product promotional technique but still hasn't shipped. Meanwhile, Lotus has been staggering under a load of announced but unavailable software.

"We have done quite a bit of preannouncing," says Frank Ingari, vice-president of marketing in the software product group of Cambridge, Mass.-based Lotus. "Now we have a lot of catching up to do."

Conventional wisdom holds that vaporware is the inevitable result of the coquettish game that developers play with users, teasing them with potential products while at the same time holding out until they have a commitment to buy.

But "nobody sets out to be stupid," points out David Moskowitz, president of Productivity Solutions, a Norristown, Pa.-based consultancy. The suspicion that a company is engaging in vaporware tactics does nothing to improve that company's position.

It is more likely that vaporware, like the common cold, has a variety of causes.

To find a cure, you must first look at the causes. And in the case of vaporware, those underlying motives include the vendors' development and marketing processes, software market conditions, the computer and business press and even the users themselves.

The problem starts, according to Moskowitz, with a lack of communications between the marketing department and the technical staff. "Marketers and engineers are both speaking English," he explains, "but not the same dialect. They have each got a different set of agendas."

Moskowitz comes from the technical side of the fence, where he says there is an oft-repeated refrain: "Everything is either an engineering triumph or a marketing disaster." This attitude, Moskowitz and others claim, is the engineers' response to what they see as unreasonable demands placed on them by their firms' marketing departments. Too often, the marketers see the need to get a product on the shelves but lack the technical knowledge to understand the level of resources it will take to reach that goal.

"Invariably, software takes longer to actually build, test and debug than many people are aware of," Moskowitz says.

In an industry that is as marketing-driven as the software industry, the upper hand that marketing possesses in the company is bound to create conflicts.

"I have been in meetings where we have given the president [of a software company] what we thought was a reasonable schedule," Moskowitz reports. After examining the schedule, the president "ripped the piece of paper, which had the schedule, in half, and said, 'Here, do it in this time.' "

But there is another side to the coin.

"There is a dramatic need for software engineers to understand the business end of their product's market," says George Hathaway, principal at the Index Group, Inc. in Cambridge. Engineers must also be more effective in recognizing users' needs, he adds.

The engineering department, Moskowitz says, "needs to understand that you have to deliver something." Too often, he claims, programmers will continue to improve a program, add features and attempt to make the software completely bug-free without realizing the business deadlines that the company has to meet to remain competitive.

That competitive edge is another reason good ideas become vaporware rather than products, explains Bruce Lynch, president of Software Developers Co., a consulting firm in South Weymouth, Mass. Lynch says that the peculiar dynamics of the software industry often force vendors to preannounce products.

First is best

To paraphrase legendary football coach Vince Lombardi, many companies say they feel that, in the PC software market, being first isn't everything — it's the *only* thing.

Most of the successful software firms, including Ashton-Tate and Lotus, achieved their success by being the first in the market with a product that had achieved a critical level of functionality.

Market latecomers, even though they may have an equal or better product, cannot develop the necessary large user base and are often forced to imitate the existing leader, losing both their product identity and the ability to capture market share independent of the market leader.

Getting the user's attention through a preannounced product is what marketers call capturing "mind share," Lotus' Ingari says, and an overemphasis on mind share has contributed to vaporware.

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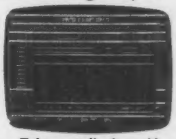

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another problem with preannounced software. When software has been announced well ahead of its ship date, user requirements may change before the product comes to market. Then the package must be delayed while new or replacement features are added.

This is the situation that faced Ashton-Tate after Dbase IV was announced. SQL became a new requirement before the product was shipped, and Ashton-Tate was forced to add this facility or risk losing its preemptive edge, Lynch claims.

Competition can also create problems in other ways, Lynch adds.

For example, Microsoft slipped when it released parts of OS/2. Lynch reports that this was largely due to the fact that the company was operating under substantial pressure from its "largest customer," which required that the operating system possess certain capabilities.

Knowing that it was competing with at least three other operating system development projects within IBM, Microsoft could not take the chance of releasing a product without those extra features, Lynch says.

He also says that vaporware is exacerbated by the management of the development process and by the fact that programming is not just a skill, but an art.

With any major software development project, the overall task is divided into many smaller tasks, which are assigned to different programmers or teams of programmers. Lynch says the way the project is divvied up can be critical to its success or failure. Project management that ignores the artistic aspect of programming encounters more problems.

To explain how software development should be managed, Lynch uses the analogy of several painters working on a portrait. It makes little sense, he says, for one artist to work on the nose while another artist draws the chin. Their differing visions will conflict.

On the other hand, one artist could work on the face and foreground, while a second artist prepares the background. This method works much better, Lynch states, adding that a similar approach is true for programming.

In addition to the delays from marketing and engineering conflicts and poor management, what appears to be vaporware may simply be "legitimate delays in software development," Hathaway says. "It's not anything that you can legislate."

Hathaway is well-versed in the subject of vaporware. Until a few months ago, he was the director of application services for Lotus, which has had a particularly bad case of vaporware. 1-2-3/G, 1-2-3 Release 3.0, 1-2-3 Mac, Agenda and seven other programs all were announced by Lotus more than a year ago and, in most cases, have yet to see the light of day.

Hathaway says that vaporware stems from the combination of four causes: a lack of planning, a lack of product management, a lack of proper development technique and a lack of personnel trained in the right skills.

Those factors are all "typical of Lotus, IBM and the corporate world," Hathaway reports. However, corporate in-house software development efforts have an advantage over those of software vendors for several reasons. The first is that "the vendor does not have as ready access to the user as the corporate world does," Hathaway says. While corporate developers can frequently refer to their users for guidance and testing, "the testing process for a vendor does not come into play until the end of the [development] cycle," he explains.

Hathaway cites Lotus developers as being affected by this problem. The delays in shipping 1-2-3 Release 3.0 were "performance issues they discovered in beta test," he says. If the development process included earlier testing, such snafus might have been avoided.

Also, software houses must create products that run on a variety of machines, while corporate developers usually only worry about a single platform.

But both groups have to worry about the limitations of the human resources at their disposal, Hathaway says. While the number of staff members may appear sufficient on paper, in the rapidly changing software market, the skills present in a company may not be adequate, he says.

"We have found that the job description of a typical software engineer is different from what it was five years ago," Hathaway says, adding that it will likely change again in the next five years.

Vendors put at least part of the blame for vaporware on the press' insatiable demand for product information. "The industry is very well covered," Ingari says. "We have suffered . . . major leaks that have been pried out of here."

Information leaked to the press stirs rumors, and then the company is faced with either correcting the rumors by providing additional data on future products or allowing misinformation to circulate.

But Ingari and others think that the cure for vaporware begins with a refusal to preannounce products — a policy Lotus began shortly after Frank King was installed as senior vice-president in charge of software products.

It is not surprising that King endorses such a policy. King is the former vice-president of IBM's Entry Systems Division, and IBM is well-known for its tight-lipped policy on products.

> **IBM reassures customers about the future, but it "doesn't say diddly-squat about what the products are."**
>
> DAVID MOSKOWITZ
> PRODUCTIVITY SOLUTIONS

In fact, many market watchers point to IBM as the best example of how a vendor can maintain a loyal following and still keep from being caught in the vaporware trap. Part of IBM's strategy is to keep users off guard with its Fear, Uncertainty and Doubt, or FUD, factor. This approach is successful only because of IBM's size and dominance in the market.

IBM's other technique, according to Moskowitz, is to assure its customers that it is knowledgeable about their current and future requirements and that it will be able to meet those needs without releasing any specific product information. IBM reassures customers about the future, but it "doesn't say diddly-squat about what the products are," he says.

One of the ways in which IBM keeps its customers loyal is through close feedback from them through the Share and Guide users groups. These users groups suggest products and features to IBM, which then replies with its approach and whether those elements are something IBM is considering including in future releases.

Ingari does not think that firms like Lotus will require that type of formalized group dialogue. However, he says that closer communication with Lotus customers is a key element of the implementation of King's no-vaporware directive.

As for users, the Index Group's Hathaway also suggests that they ask three questions of any vendor discussing a potential or preannounced product:

- What is the planned availability date?
- What specific product features are committed to be in the product?
- What percentage of the beta test plan has been completed?

The more specific answers that vendors volunteer for the first two questions will give the potential buyer a good indication of how close the product is to vaporware. A specific ship date and a list of specific features mean that the development process is pretty well established.

The answer to the third question is also important, Hathaway claims, because many problems with software — as Lotus discovered — do not become apparent until the package undergoes the rigorous testing of use in the real world.

"Many delays and cancellations of products result from beta testing," Hathaway says. "I have seen more delays and cancellations of products in beta test than anywhere else." And if the percentage of the beta test completed is near 0%, "don't count on seeing it," he advises.

Lynch adds that software firms should take advantage of another old development trick: Begin several development projects on the same product simultaneously and use the leverage of competition to force a product to be developed in a reasonable time frame.

In the long run, Hathaway says he thinks vaporware will cure itself. "I feel that the whole issue of vaporware is going to result in important changes."

Companies will be forced into better defining the marketplace before announcing a package, rather than using such an announcement as a trial balloon to test the market's reception of a product, Hathaway states. And "the marketing function will have to balance business pressures with the technical ability of the company," he adds.

Finally, Hathaway says, companies will "just have to do a better job of building quality products." ❖

Jenkins is a Boston-based free-lance writer who focuses on technology topics.

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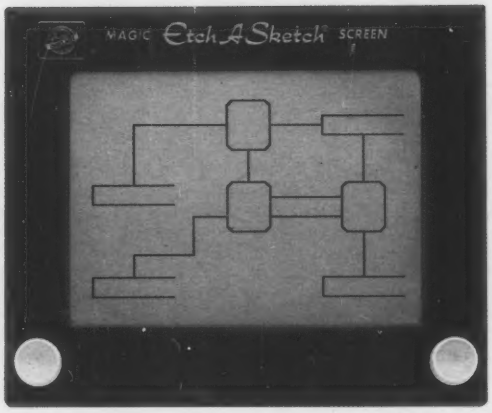

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The CASE payback

Nothing ventured, nothing gained

BY MARTIN B. AZARNOFF

The robot on the factory floor had a simple, repetitive job: Pick up a 40-lb subassembly and move it from one place to another. It did this well.

One day the destination point for these 40-lb pieces of metal became full — completely jammed up by a slowly growing pile of subassemblies. Still the robot went about its job: picking up a finished subassembly in its maw, pivoting, then adding it to the ever growing pile.

Normally, as it deposited a piece, the maw expanded. That day, because of the growing pile, the piece wasn't fully released. The subassembly in its maw did not get dropped off.

As the robot arm began its quick return to pick up another subassembly, the net effect was to throw 40-lb pieces of metal at high velocity in all directions. It wasn't pretty.

Further complicating the situation was the robot's Off switch, located on the robot itself. Getting near it was a death-defying act, but eventually one enterprising employee was able to crawl close enough to turn off the robot.

Everyone agreed that there was a serious problem here.

It was soon solved: A metal cage was built around the robot so it could never again throw the pieces as far.

Solving problems in today's complicated data processing environment is often akin to the story above. Everyone sees that there are problems. Agreeing on solutions is another matter altogether.

Various answers are gaining currency among MIS professionals. Managing information systems well increasingly involves seeking new technologies, such as software automation, computer-aided software engineering (CASE), artificial intelligence, personal computer-based solutions and conversion systems. Of these technologies, the most talked about path for

Azarnoff is a San Jose, Calif.-based free-lance writer who specializes in topics for MIS.

DP's future is CASE.

According to E. Allen Hershey, director of the Advanced CASE Technology Center at Arthur Young's Ann Arbor, Mich.-based office, CASE is "the MIS panacea of the '80s."

Unless a company knows how to take advantage of the technology, it may end up in worse shape using CASE, he claims.

"I'm not saying that CASE is not useful if people are willing to embrace it," Hershey says, but "buying a CASE tool doesn't turn you into a good developer." Nevertheless, for a typical MIS organization involved in maintenance, administration, production and strategic system development, "CASE is the most significant thing to look at," he claims.

"The reality is that people find it hard to take energy away from putting out forest fires.... Half of the people I talk to say, 'Great, CASE would really help, but I don't have the time for it.' "

BARBARA BOULDIN
AT&T

Barbara Bouldin, CASE product manager for AT&T, agrees with Hershey's assessment of the technology. Her book, *Agents of Change: Managing the Introduction of Automated Tools*, will be available this fall from Prentice-Hall, Inc. She is a pioneer in CASE use and has installed a successful CASE environment in her operation at AT&T.

"It's not hard to be called a 'pioneer' when you've been using a product [for] two years and 11 months and the product has only been available for three years," Bouldin laughs. In her previous post at AT&T, Bouldin began looking at CASE when management decided that it had to improve its situation and minimize troubles brought on by the department's growth. Her boss was part of a task force of mid-level managers that decided a systems analysis tool would help.

"We were going to build one, but my boss saw an advertisement for a product and asked me to assess its relevance to our needs. I thought [the systems analysis tool] looked good," and so the group implemented it, but not without struggles.

"My message is that implementing CASE demands attention to the human factor. The average person in a DP organization today has his hands full. These people are not sitting around twiddling their thumbs. People are busy, overworked, trying to survive and do things the way they've always done things. There is a lot of Cobol, a lot of VSAM, and frankly, most people don't see an urgency to change," she explains. When trying to implement CASE — even for those who see it as an advantage — her ideas were met with a lack of enthusiasm.

"The reality is that people find it hard to take energy away from putting out forest fires," Bouldin continues. "The reality is that programmers and systems analysts are frequently awakened at 3 a.m. to solve a problem. Half of the people I talk to say, 'Great, CASE would really help, but I don't have the time for it.' "

Bob Scheussler, director of information systems technology at Rockwell International in Seal Beach, Calif., concurs. In any production system, such as payroll, bookkeeping, accounting or inventory, time is of the essence, he says. There is line responsibility to fix code, maintain it and live with it. Naturally, people will migrate to anything that will allow them to do that better and faster. However, "the early [CASE] tools and aids weren't actually helping. They got in the way of doing the job." Scheussler is now examining the next generation of tools, and for him, the CASE hot button is reengineering, which takes existing code and restructures it to make it easy to maintain and enhance.

Budding technology

"CASE is a flower starting to grow," says James Proesel, director of MIS planning and decision support systems at Skokie, Ill.-based G. D. Searle & Co., an $800 million pharmaceutical company. "Finally, products that actually make CASE work are coming to the forefront."

The MIS group at Searle is in a situation that many other MIS departments face. CASE looks inviting, but what is the value of being the first kid on the block with a CASE system? Is there going to be a payback?

At many companies, including Searle, there is a history of package software and a clear need to maintain the mountains of existing code.

Proesel points out that packaged software has demonstrated some advantages and disadvantages. With packaged software, the system design is done — supposedly well done — and the vendor provides support. But there are the up-front costs of buying off-the-shelf software and the need to adapt the business to the software. "Any company still has to figure out how a package fits into the organization, and people have to figure out how it works," Proesel says. When a package doesn't meet needs, it must be modified, and "if you're paying six digits for a package, you really don't want to modify it." Also, when the vendor comes out with a new version, you don't want to have to retrofit it, he adds.

Proesel says he finds the promises of CASE exciting. Although there is still an

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initial cost and a necessary educational process involved, the implementation of CASE is very different from that of a packaged program. "CASE will look at the needs, the environment and implement the design at the highest levels. Computer-generated code is, idealistically, cleaner code, making the test period significantly better. We can, in theory, automate the whole design and development process."

However, before CASE is implemented at Searle, many valid questions must be addressed. For example: How long will it take to implement? What about the increased end-user involvement that CASE imposes? Will this new way of distributed data management work? Can the company effectively teach everyone, from technicians to programmers to managers, the new way of thinking that CASE demands?

"The time it takes to develop a system — any system — often outstrips the longevity of the department you are working for. People change, business directions change — all of which can make developing a system a nightmare," Proesel states.

Still, the potential of CASE beckons. At AT&T, Bouldin explains, the siren song of CASE won and resulted in success. In her operation, there are now "400 DP people working with 20 to 25 major systems — material accountability, customer data base, order processing — and thousands of users. All of these people are, in one way or another, now using CASE. Some just to produce better documentation, some sitting in front of their PCs, but CASE does exist today.

"I've seen it. One floor up and 20 feet over is another CASE system with a

Looks like a job for CASEy Jones

BY BERTON LATAMORE
SPECIAL TO *CW FOCUS*

IT WAS NO ONE major project but rather a constantly growing application development queue that prompted Southern Pacific Transportation Co. in San Francisco, one of the nation's largest railroads, to look into CASE. The company spent nearly a year investigating approximately 20 products before choosing the Application Productivity Software (APS) Development Center from Rockville, Md.-based Sage Software, Inc.

"We're an IBM IMS DB2 shop," says Gary Borrelli, director of applications development at Southern Pacific. "We have some very complicated applications, which not all of the products that were available could handle. We felt Sage could handle anything we had. We were very interested in having our whole staff of 160 programmers do the development in APS."

In fact, he explains, he was pleasantly surprised at how quickly the organization was able to get everyone up to speed. The product was brought on board in January 1987, and from that time on, virtually all the Cobol code generated at Southern Pacific has been done through APS. Not only does the railroad use the software to develop standard accounting, but it also has used it to develop railroading applications.

Latamore is a free-lance technology writer based in Burlington, Vt.

For instance, APS was used to create a crew dispatching system. Crews are picked according to seniority, whether individuals have had enough rest — an element that is prescribed by law — and other factors, and the new software automates the process of tracking the data for the thousands of crews that work for the railroad.

APS also exceeded Borrelli's expectations in the amount of time it saved in application development. Consequently, the application queue is shrinking, but that is only one of the benefits of using the software, Borrelli says. "It's a much more structured approach — everybody is programming the same way. That helps maintenance," he says.

"The prototyping ability, which allows you to really develop a shell of a system — just enough for the end user to see what it looks like — is a nice benefit," Borelli adds. "The user feels involved, and you can make changes faster. Consequently, my people are less resistant to making changes. It gives the user a better feeling of being involved with the product."

Also, he says, APS writes hardware-independent code. When the program is finished, a programmer can tell it what platform it will run on, and the system automatically makes any necessary changes. When upgrade time comes, he can run the APS applications back through the generator and have it readapt them to the new environment. The result of this capability, Borrelli says, is that upgrades may become almost painless at Southern Pacific.

Data interchange project calls for quick-change artists

FOR KOPPERS AND CO., a worldwide supplier of construction materials and services, handiwork keeps business brisk. But when it came to the firm's data interchange project, manual labor was not the answer. Rather than hand-code millions of lines of Cobol code, the company turned to a CASE tool.

Pittsburgh-based Koppers quickly discovered the importance of CASE when it reorganized its information systems around a Digital Equipment Corp. VAX-based distributed processing system two years ago.

Koppers installed DEC Microvax computers in each of its 15 plants and networked them to a VAX-11/780 in the home office. The plan was to install identical business programs in all the plants so that they could exchange data efficiently with headquarters.

As a result, MIS was faced with the massive job of writing virtually all its Cobol code for a type of hardware that the programmers weren't necessarily familiar with.

To complicate the picture further, each plant has its own idiosyncracies related to the particular market in which it operates. New software had to be flexible enough to adjust to all of these elements without creating efficiency problems.

The resources Koppers' MIS department had available were severely limited given the size of the project; the company had no more than 20 programmers. The job was estimated to be a four-year project if coded by hand, but that figure was unacceptable to the company.

To speed up the process, Koppers turned to the Netron/CAP Development Center from Netron, Inc. in Toronto, a back-end CASE product designed to write lines of Cobol from high-level instructions input by the programmers. The product is distinguished from a front-end system in that a front end helps systems analysts and end-users design programs.

For Koppers, Netron/CAP turned out to be a good choice.

"In the last 18 months, we've produced payroll, order entry, inventory, general ledger and accounts payable systems — a total, coordinated system — using Netron," says Dale Novotniak, supervisor of systems programs at Koppers. "All of it is running at least in test mode, and about 50% is live. We've saved 50% of the programming time."

Not only was development time cut in half, development cost was cut by 50%, according to Dean McAllister, Koppers vice-president of MIS. Maintenance costs have also been reduced, because 80% less time is spent maintaining the new systems than was spent on the older, hand-coded Cobol systems.

Furthermore, because each plant is running standard software, maintenance has been standardized. When management at a site requests a unique program or special report, the MIS department in Pittsburgh fills the request and transfers it through the corporate VAX.

Although only 50% percent of the new system is live, it is already having a major impact on the corporate bottom line.

"It's enabled us to close our books maybe four days ahead of time for the accounting month," Novotniak claims.

Like everything, Netron/CAP isn't perfect. Novotniak has asked Netron to develop a report generator simple enough for end users to use directly.

"We may provide only a customer listing by customer number, for instance. Maybe a manager needs an alpha listing. He'd have to call me, and I'd have to produce that for him. If Netron had some sort of ad lib reporting module he could do this on his own. Usually these are just one-time requests — why should [the manager] have to bother a programmer? However, I think that's a long time down the road," Novotniak says.— BERTON LATAMORE

graphic interface. The end user sits at a PC tied to a minicomputer tied to the mainframe. It is computer-aided software engineering. It is not something tomorrow. It is here now, running and being used," she says.

Bouldin acknowledges that there aren't many other CASE success stories — yet. "It is all possible, but the question remains, Will people accept it? It is a management and a people problem."

The technical problems of implementing a CASE system are there, but they are not the hurdle they once were. "Hardware is catching up. We can talk about serious CASE development efforts now: system test tools, reverse engineering, data modeling. I believe we now have at our disposal the logical and physical architectures that will allow users to look at information any way they want. The possibilities are staggering," she claims.

Arthur Young's Hershey says he sees CASE being approached by users in the following three areas:

- People who emphasize diagrammatic approaches to analysis and planning, characterized by products that run on a personal computer and allow users to draw computerized diagrams that were typically done by hand.
- People who want to automate as much of the software life cycle as possible, with the emphasis on design and construction.
- People who put an emphasis on work breakdown, or project planning, using CASE to boost the traditional method of training and support.

The choice of CASE tools in these categories varies according to the history of the organization, Hershey says. "If it is a Cobol shop, then cogenerator systems can provide a lot of value by increasing productivity. If the organization has a significant amount of rebuilding and new development, then CASE tools helping with planning and analysis can be tremendously valuable. Everyone is trying to figure out how to implement CASE in the best possible way," Hershey says, adding that CASE's potential is much greater than today's offerings provide.

This gap between CASE's potential and products brings up an area of concern. There is not yet a total CASE environment that is readily available from software vendors. The software environment that is using CASE is a mixed environment, both high-level code and Cobol, according to Scheussler's experience at Rockwell.

Hershey echoes Scheussler's assessment. "There are a lot of different proponents and components, none of which is in itself a complete solution. There is a large difference between CASE tools and a totally integrated CASE environment. We are working to bridge that difference but aren't there yet. Only in the last two years has this kind of technology been available to people. Most are now seeing it as having sufficient value to explore," he says.

An area that may provide a powerful boost to CASE technology is that of artificial intelligence and expert systems, Hershey predicts, even though most current uses of AI are expert systems designed to automate or help with clerical aspects of MIS.

Rex Maus, director of advanced technology at CAP Gemini America, a data processing consulting company in Westchester, Ill., recently spoke to a group of

> **"There is a large difference between CASE tools and a totally integrated CASE environment. We are working to bridge that difference but aren't there yet."**
>
> E. ALLEN HERSHEY
> ARTHUR YOUNG

MIS managers at Sears Roebuck and Co. Maus says he believes that "CASE tools are still like conventional tools, algorithmic tools. Humans, however, don't solve problems in algorithmic routines. To continue to be effective problem solvers, [MIS] must begin to address a new way of thinking," one that incorporates AI and symbolic programming.

According to Maus, an author of many books on AI and expert systems, AI is a foundation on which to build the needed changes in information management. He proposes that MIS not rely solely on programmers to handle information management. What must be done, he says, is to design PC-based systems so that the users can build and maintain information.

"For the past 30 years, AI has been in an ivory tower. I go around demystifying AI. When you approach AI as an affordable, easy-to-use, practical business tool, people accept it," Maus states.

Maus points to a case in which taking the technology plunge may have been initially intimidating but eventually rewarding. "One company developed and installed an expert system in its manufacturing process. The cost to do that was close to $400,000. But the result was a $2 million cost savings. It is planning to fine-tune and sell this system to others."

But Maus, preaching the gospel of AI, and Bouldin, Hershey and others, touting the case for CASE, all emphasize the same thing: People should start small. Maus's clients get the following advice: "I tell them I'll help them build the bait shop, but I won't be around to help them dig for worms." ❖

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The DSS caper

A case of mistaken identity?

BY HELEN PIKE

KET TOM

It's around 10 o'clock on a Monday morning when the brown Rolm CBX telephone rings on my desk. I look up from reading the week's edition of *Computerworld*. The phone rings a second time. I pick it up. The voice on the other end is low, not anxious to identify itself, moving hurriedly past my introduction.

"Miss Pike . . ."

I nod; he continues.

". . . I work for IBM . . ."

I brace myself.

". . . I just finished reading your story on executive information systems in the latest issue of *Focus* . . ."

I nod again. Here it comes.

"You didn't mention anywhere in your article anything about decision support systems. Is EIS going to replace decision support? What are all those users going to do who have decision support systems? Are they just going to fade away? Is DSS a wasted investment? Are they going to be able to leverage their time and money?"

I take a breath.

"You know, it was very upbeat about EIS. Did you know that not everyone has that point of view?"

I shake my head.

"There've been some very excellent articles on decision support and how fundamental it is to a company — more than EIS — written in the *Sloan Management Review*. Have you seen them?"

Like all the other exchanges I give the only response I have time for: I shake my head again.

"I really think you should look into it."

Pause.

Another pause.

In my mind, I'm muttering that it isn't my job to do a corporation's marketing spade work. But we're into a third pause, and I blurt out, "You may have a point there, although the story really was about executives increasingly using information stored in the data center . . ."

"But what about decision support systems that have been around all these years? Are people going to stop using them?"

I don't know. As it is, I have one knee deep in updating an article on whether workstations belong in MIS and am also kicking around the research for a profile on Digital Equipment Corp.'s information systems strategy. I squint at the editorial calendar pinned to the wall behind the phone. A software productivity issue. Oct. 5. I tell him I'll look into it.

Stories come to journalists in a variety of ways. Sometimes you get them by standing behind a potted palm in a hotel lobby or by looking through trash cans. Sometimes it's the unfairness or mean-spiritedness of an issue that needs to be brought to light and corrected. And sometimes people call with complaints that mask a desire to get ink for themselves or for their employers. But as for this potential story, Mr. Low Voice wouldn't leave a forwarding number.

"I'll call you."

He doesn't, but others do. I suspect they are put up to it, but I jot down notes on yellow paper anyway. Three months later, I remember these conversations when the *Focus* staff sits down for a story session. I also recall a nagging feeling that predates the Big Blue phone call. Maybe some of the executive information systems (EIS) proponents have been just a little *too* positive in their interviews. A DSS update story is proposed and assigned.

Working against deadline, I make some calls and trail data bits to uncover information on decision support systems. An 11th-hour call to International Data Corp. in Framingham, Mass., brings market analyst Clare Gillan to the phone and away from the stacks of raw data that she is culling and collating from a decision support system user survey.

"There are a lot of gray areas," Gillan says, referring to the challenge of determining which software plays in the DSS market and which doesn't. The classic, academic definition of DSS refers to summary transaction data from a mainframe. According to Gillan, technological and market forces are broadening that definition to include the following five subcategories:

- Financial modeling.
- Executive information systems.
- Spreadsheets.
- Software tools such as fourth-generation languages, databases and graphics and statistical packages.
- Packaged applications that aid in making a decision.

Rather than a narrowing of the market's definition as it grows older, DSS is expanding. "DSS is still tools-oriented, but, for example, spreadsheets are becoming a tool to build a financial model," Gillan says. The IDC survey is prompted by software vendors' need to know and understand what users' interests are. And those interests include designing for smaller systems.

"Software companies are still making money

Pike is *Computerworld Focus'* senior writer.

off IBM mainframes, but some are going to minis and personal computers," she adds.

Among the companies on the latter data trail is Execucom Systems Corp. in Austin, Texas, which offers its data analysis tools for end users to run off minicomputers like DEC's VAXs and Hewlett-Packard Co.'s HP 3000 and 9000 models and microcomputers like IBM's Personal Computers and Apple Computer, Inc.'s Macintoshes.

"Our next market is on the smaller systems," says Mark Rylander, Execucom's marketing relations director, explaining the company's transition from IBM mainframes. "The medium systems are expected to grow 11% to 20% while the larger systems will grow only 3% to 5%. We've placed more emphasis in the last year on those [mid-level] environments," he adds. "Those systems are selling into departments that require more ease of use — finance departments that want their own systems because the response time [from a mainframe] was bad."

AI holds the key

For some companies, artificial intelligence features are a way to sell software for DSS purposes. Execucom, as well as other vendors, see AI features as a way to leverage the capabilities of their products and their customers' hardware investment. Rather than being intimidating to the end user, Rylander says, expert systems "take knowledge from [the corporate] system and give users guidelines on what to do with that data. Defining your scenarios means laying down [AI-type] rules, anyway."

AI's increasing influence in DSS isn't a surprise to some. Richard Crandell, who founded Comshare, Inc., a business management productivity software house in Ann Arbor, Mich., says that DSS "is becoming the repository of knowledge. . . . It is a fundamental tool to understanding a company's performance. [It is] a knowledge base of rules.

"There's been a tenfold [DSS] size increase in the last five years to handle the multidimensional view of a company," Crandell says. He sees a decision support system as a "cube of views" that takes into account such vistas as markets, geography and distribution channels. The size of a financial model can be multiplied by the size of the view, he explains.

Crandell uses banks as an example of what he means. Initially, banks gauged their profitability branch by branch. They then based profitability on products such as payrolls and certificates of deposit. Now they are adding to those panoramas the view taken of a customer's individual profitability.

DSS won't be squeezed by EIS because "companies will always need staff analysts. No executive wants to do his own financial modeling. He doesn't want to create the information," Crandell says on the issue of EIS crowding out DSS. On the other hand, the executive is increasingly tapping the resources of the corporate database "because of a pent-up demand to understand the enterprise," he adds. "It's an issue of focus."

Or perhaps of vistas, because Crandell also describes top-level executives as being more outward looking, needing access to such information as public data along with the summary of internal information they receive from subordinates. "EIS is directly front-ending DSS. EIS puts the human interface on it."

Crandell notes that sales of System W, Comshare's flagship DSS software, are being spurred by sales of Commander EIS, the company's newest offering aimed at the tonier end of the market. At the same time, he says, System W is evolving to handle much larger applications as analysts add more factors (the cube of views) to the equation.

With a word of caution that IBM broadly interprets the concept of DSS ringing in my ears, I call Armonk and shadowbox with a media relations person for the chance to ask IBM just what it's up to in this area. Eventually, Robert Berland comes on the line in a conference call from his office in Milford, Conn. He is vendor and development operations vice-president for IBM's Application Systems Division and has spent a year figuring out where and how DSS and EIS come together and where they diverge.

"DSS is the infrastructure. It's complementary to EIS. EIS isn't displacing it. EIS is useless unless there's a meaningful DSS infrastructure," Berland says, adding that IBM's plans for the Application System/400 mid-range upgrade and its suite of products to come "is a major part of DSS as our office function strategy. A major element."

In harmony

IBM is also trying to get policy makers to be part of the solution instead of crossing swords with MIS executives, he explains. There's a reshaping of the industry that's going on because of the movement to get more executives on the computer system, he says, and they, in turn, are putting pressure on those underneath them to maintain data's consistency and its integrity.

"Data before was created by the way the programmer thought, not the end-user receiver," Berland says. "My belief is that ease of use is going to be driven back into DSS, influencing the tools and making them more efficient."

Efficiency is another clue in the DSS market mystery, for it turns out the name of the game, just as in EIS, is using data in more and varied ways to yield better productivity and profits.

"We're manufacturing at a higher quality, we're shipping faster and we have inventory in the right places," says Bob St. John, technology services manager at the U.S. headquarters for Ciba-Geigy Corp., one of the world's large dye companies. To do so means its "DSS has to be run weekly or daily. We're pushing the limits of what's available in order to stay ahead of our competitors," he says.

Working out of the multinational's U.S. office in Ardsley, N.Y., St. John and his associate, Tony DiBattista, an operations resource analyst, talk about the evolution in managing financial data. In the past, keeping the books meant putting figures down in blue-columned ledgers and crunching numbers took place on a comptometer, an early adding machine. Forty-nine years old and with the company for 27 years, St. John remembers "a time period when Ciba-Geigy didn't own a computer."

Every shape and size

Now there's an IBM 3090 mainframe. And dumb terminals. And PCs. And IBM Personal System/2s. DiBattista, who's 26 and has probably only seen a slide rule in a museum, mentions the gradual change to downloading mainframe spreadsheet applications and analysis programs to PCs to be used by financial planners, controllers and analysts.

"DSS is an interactive computer-based system that analyzes a specific problem and defines a solution," DiBattista explains. "EIS is a one-way flow of information while DSS puts information back into the system. . . . I suppose executives could take [DSS] with them as they move up the corporate ladder."

St. John isn't so sure whether DSS will evolve into a type of EIS, however, commenting that it's still too early to tell what kind of an impact PCs will have on application migration. "It's not a black-and-white issue. . . . EIS gives you information and you examine it. DSS has more analytical tools and higher graphics capabilities that allow you to do more than examine data."

Where 20 years ago there were separate, unrelated quarterly reports on sales, inventory and customers, today graphics-driven applications running off PCs can integrate reports on a monthly or even weekly basis for comparative purposes. The Ciba-Geigy MIS team is now adding a function that will allow for the manipulation of numerical information for what-if analyses, St. John says.

Most of this undertaking is customized software for dealing with financial investments and acquisitions, human resources and risk analysis, according to St. John. Ciba-Geigy has a a program written in Information Builders, Inc.'s Focus that runs off PCs, terminals and PS/2s and is used "in a concerted effort to see how to manage better operations," St. John says. The next step involves AI techniques. Already Ciba-Geigy has the Expert System Environment from IBM as well as Nexpert from Neuron Data, Inc. in Palo Alto, Calif.

Despite the technological advances, St. John comments, wryly, "I still don't see anyone leaving early."

"Least of all me," I think to myself as I wrap up this story. The sky is the tint of Depression-era glass and Boston's commuters are coming home to Framingham. Stories clipped from this week's *Computerworld* leave the newspaper looking like Swiss cheese on the floor beside my desk. I briefly contemplate how I can have incoming calls forwarded to my boss' phone the week this *Focus* issue hits the stands. If Mr. Low Voice calls, I'm ready for him, though. Then, again, maybe this article will leave him speechless. ❖

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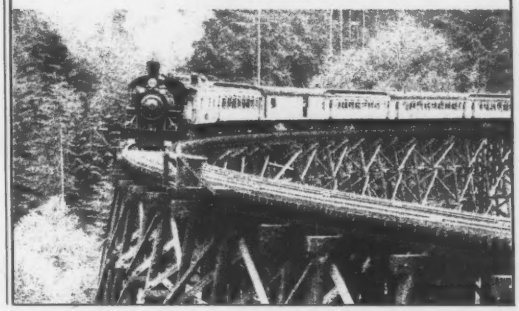


Electronic emancipation

UIMS free users from system complexity

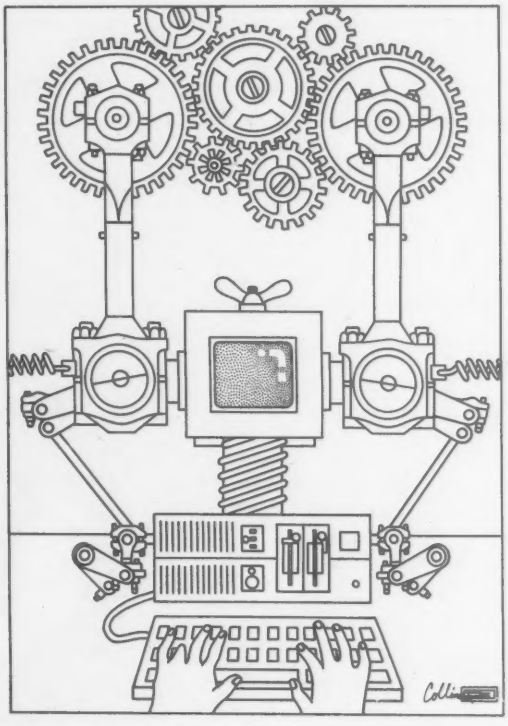
BY EVELYN W. WILK

Back in the 1890s, Oscar Wilde wrote that civilization requires slaves to do the grunt work. "The future of the world," he predicted, "will depend on the slavery of machines." Wilde's notion of the liberating potential of automation didn't take into account today's need to have a Ph.D. to know how to operate the machines. But that's what has happened with some of our fancy automated office technology.

All too often, end users find themselves staring at blinking screens trying to decipher error messages that appear to have been written by experts in mental torture. A distaste for learning the intricacies of esoteric programs drives end users to create databases using Lotus Development Corp.'s 1-2-3 rather than to take the time to learn the commands of more appropriate software.

In the Microsoft Corp. MS-DOS and Unix desktop environments, programmers with a belief that "more complex is better" continue to assault end users with yet another way to save a file to disk or exit a program. The answer to this complexity is simplicity. The designers of the Xerox Corp. Star workstation and its successor, the Apple Computer, Inc. Macintosh, understood this concept, and their work is leading end users out of the maze.

Today, it can finally be said with a degree of confidence that for the end user who doesn't care to become a hacker, relief is in sight in the form of user interface management systems (UIMS). A UIMS performs two functions. First, it acts as the interface between software programs, allowing the easy, intuitive execution of maneuvers, such as cut-and-paste, between unlike programs. Today's multiwindow screen management programs offer capabilities that demonstrate the bare beginnings of the rich UIMS functionality that lies ahead. In addition, the full-fledged UIMS of tomorrow will be hardware independent and it will be graphically based.



The UIMS graphical user interface uses the object-oriented metaphor (sometimes called direct manipulation) of pointing at an object on the screen, such as an icon or menu bar, and invoking its underlying function by the simple act of choice. Object orientation is familiar to the computer novice; it's analogous to the operating controls of machinery like a car. I often rent cars in my travels, and I know that if I spend a few minutes to locate the primary controls — the gas pedal, gearshift, brakes, lights and windshield wipers — I can operate the vehicle safely. I don't need to know what type of engine lies beneath the hood.

A similar set of standard predetermined objects form the building blocks for UIMS-based software development. Software that follows the standard allows the novice user to navigate its primary functions, learning more advanced functions while making productive use of basic ones.

Apple provides the best current example, having successfully forced this standardization on Macintosh software developers by putting the UIMS in proprietary hardware. Macintosh users often become devotees of the

Wilk, a speaker and consultant, is president of ESW, a Chicago-based firm specializing in office technology. She frequently addresses the use of emerging technology as a tool to support business objectives.

Macintosh interface and attempt to convert all who will listen. Apple's success has not been lost on IBM, which is currently distributing its standard specifications for development under its Presentation Manager (although IBM has vowed to offer software developers more leeway). In the engineering workstation environment, Apollo Computer, Inc.'s Open Dialog offers a UIMS based on Unix and the X Window System.

Sophisticated personal computer users sometimes complain that the object-oriented metaphor is too simplistic. A well-designed UIMS isn't only for the novice user, however. Objects are excellent for many basic functions, but sophisticated and complex applications may require the more conceptual, abstract reasoning offered by language. This can be accomplished through the option of procedural, command-driven operations for sophisticated user processing, while providing object-oriented macros to further simplify operation for the novice. Some of today's user interfaces accomplish this dual function through the use of pull-down menus with blank bars for user-defined single-use commands.

Although it garners all the attention, the user interface is just the first half of a full-fledged UIMS. The second function is to provide navigation between software operations. This element is at the root of why the Presentation Manager goes beyond user interface to incorporate both Communications Manager and Database Manager functions. IBM is betting that its tight integration among interface, communications and database functions will offer a more seamless end-user environment than do systems using products from different vendors for these tasks.

Until Presentation Manager, companies wanting both capabilities in a UIMS have been forced to develop their own integration between these functions. More often, navigation capability is left out, and the user is required to follow multiple steps when passing information between software packages. IBM hopes that Presentation Manager will be attractive to organizations that want to leave that difficult integration to outside vendors.

"Adventure is the result of poor planning."

—Colonel Blatchford Snell

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Circle Reader Service Number 13

It will be interesting to watch the development of this integration side of UIMS function. PC users are an individualistic lot. Historically, they have chosen multiple products over integrated ones, such as Lotus' Symphony or Ashton-Tate Corp.'s Framework. Their argument is that they want the best possible function from each type of software. The most successful integrated products have been the office automation umbrella products such as Digital Equipment Corp.'s All-In-1, Data General Corp.'s Comprehensive Electronic Office and Wang Laboratories, Inc.'s Wang Office.

But these OA software packages generally lack a graphical user interface and all run only on a single vendor's proprietary products. Today's PC user is often the sort who enjoys triumph over difficult integration problems. Tomorrow's more mainstream user, with the aid of a UIMS, may not have such loyalty, focusing on productive work rather than fiddling with the software.

Xerox roots

UIMSs are not new. They first appeared in university laboratories and in research done by companies such as SRI International, Inc. in the late 1960s. Xerox was the first vendor to market a product, based on work done at its Palo Alto Research Center (PARC) in the 1970s. The Xerox Star workstation was the main attraction on the exhibition floor of the 1981 National Computer Conference in Chicago. Xerox introduced icons, windows, the mouse and object-oriented programming to corporate America. But the workstation was too expensive, too slow and too proprietary in a world that was beginning to standardize on IBM's PC-DOS and Microsoft's MS-DOS.

In 1984, Apple's Macintosh debuted with a famous two-minute commercial on Super Bowl Sunday. Apple had earlier produced the Lisa, with both the advantages and drawbacks of the Xerox product on which it was based. The Mac and its Finder user interface quickly found acceptance in the marketing and communications departments of corporate America, but mainstream corporate PC users were already hooked on the MS-DOS world.

Also in 1984, Apollo began testing Domain/Dialogue System, the proprietary forerunner to its current Unix-based hardware-independent UIMS, Open Dialogue. Open Dialogue is the first commercially available full-fledged UIMS, but it is targeted at the technical workstation market. It uses X Windows to address the issue of using a single tool set across heterogeneous hardware platforms. Apollo has even incorporated its proprietary operating system dependencies into a single module of Open Dialogue in order to minimize the effort required to port programs to other hardware environments.

Other computer companies have also developed proprietary UIMSs. In another offshoot of PARC, several former Xerox employees formed Metaphor Computer Systems, Inc., which combines a UIMS with proprietary database software and hardware aimed at a niche market, the marketing and research departments of consumer products companies. Metaphor has achieved a unique success; IBM recently purchased an equity position in the Mountain View, Calif., company, its first equity investment in a software firm.

The latest entrant in the UIMS arena came this spring with the announcement

of Open Look from AT&T, Sun Microsystems, Inc. and Xerox, again building partially on work done at PARC.

Why are the vendors so interested in this area? IBM is using its upcoming office automation software set, now under development, to test the Common User Access, the user interface portion of its fundamental systems architecture of the 1990s — Systems Application Architecture. The newly formed Open Software Foundation (OSF) has announced that its first order of business is the endorsement of a graphical user interface for its Unix environment. Open Look, Open Dialogue and Presentation Manager are all potential candidates for selection.

The role of Unix and OSF are interesting in this rapidly evolving environment. The OSF members understand that the days of relying solely on their proprietary operating systems are numbered. As users have become more computer literate, large firms are decreeing that their future computing environments will be multivendor. Just as the industry moved from "separate and unequal" word processing and personal computing environments in the early 1980s to today's standard desktop platforms, the 1990s will see operating environments that are independent of their supporting heterogeneous hardware platforms.

Unix is the only operating system available today that can offer that hardware independence. Add a UIMS on top of Unix, and end users have that independent environment with a standard interface, portable software and, at the same time, the option for vendors to integrate their own "better than the others" products without confusing the end user.

That's OK as a reason for vendors to be interested in UIMS, but what about end users? Why should they care?

Users should care because they are about to hit against a glass ceiling in their efforts to extend the use of computers in the office. As hardware costs decrease, support and training are becoming the major expenses connected with the installation of office desktop workstations. Already, the first-year support and training costs of a new PC exceeds its capital cost. And the training will never end if users continually add software with unique operating characteristics.

Unless software becomes self-teaching, there is a danger of having no time left for productive work. With a UIMS, once the user learns the basics, all applications are added to the tool kit available for automated support of business activities. The standard operations reinforce learning while using different software — no more need to remember how this particular program saves a file to disk.

Different strokes

The training issue has another aspect. With the advent of professional and managerial end-user computing, the approaches that worked with secretaries and clerks will have to change. While support staff members were sent to school for a week and told to learn or lose their jobs, middle managers and executives won't listen to that approach. They expect computers to be flexible tools that they can bend to fit their work styles, not to modify their proven successful styles to fit the idiosyncracies of software designed by and for computer scientists. A properly designed UIMS makes the machine respond to human ways, not vice versa. As a corporate executive recently said, "We must be technology served, not technology driven."

Full utilization can be translated into productivity gains both in the end-user population and in the systems development staff. Today's custom programs use as much as 40% of the lines of code to handle navigational issues rather than computational issues. Computer-aided software engineering tools address the standardization of navigational procedures in program development, but the lines of code are still generated in the program, taking up space and compute cycles. With a UIMS, the application sends generic calls to the UIMS, which then translates them according to the workstation's particular hardware configuration.

Once a UIMS development environment is specified (which is no mean feat), UIMS can significantly decrease application development requirements, both in manpower and in calendar time.

It's all relative

A cautionary note. Einstein taught us that energy is conserved. In software development, that can be taken to mean that the effort is required somewhere in the software development chain. A UIMS reduces effort over the long haul for the end user and for the applications developer. But the effort does not disappear — it moves to the beginning of the development chain, in the specification of a tailored UIMS development environment.

This extra toil at the onset will produce savings, because a single development effort will provide a long-term base for end users developing and using multiple applications.

Today's automated environment forces the end user to be a slave to the system, concentrating most on procedures. The UIMS front-end systems, available by the beginning of the next decade, will free users to think about how to use desktop computers most effectively to support business objectives. The end users of the 1990s, armed with a UIMS, will approach the system with confidence, making the machinery their electronic slave, as Wilde predicted. ✧

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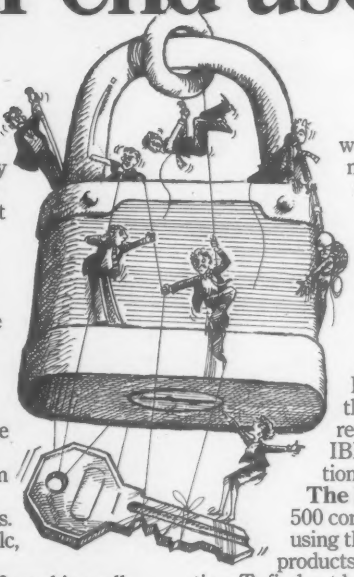

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Circle Reader Service Number 14

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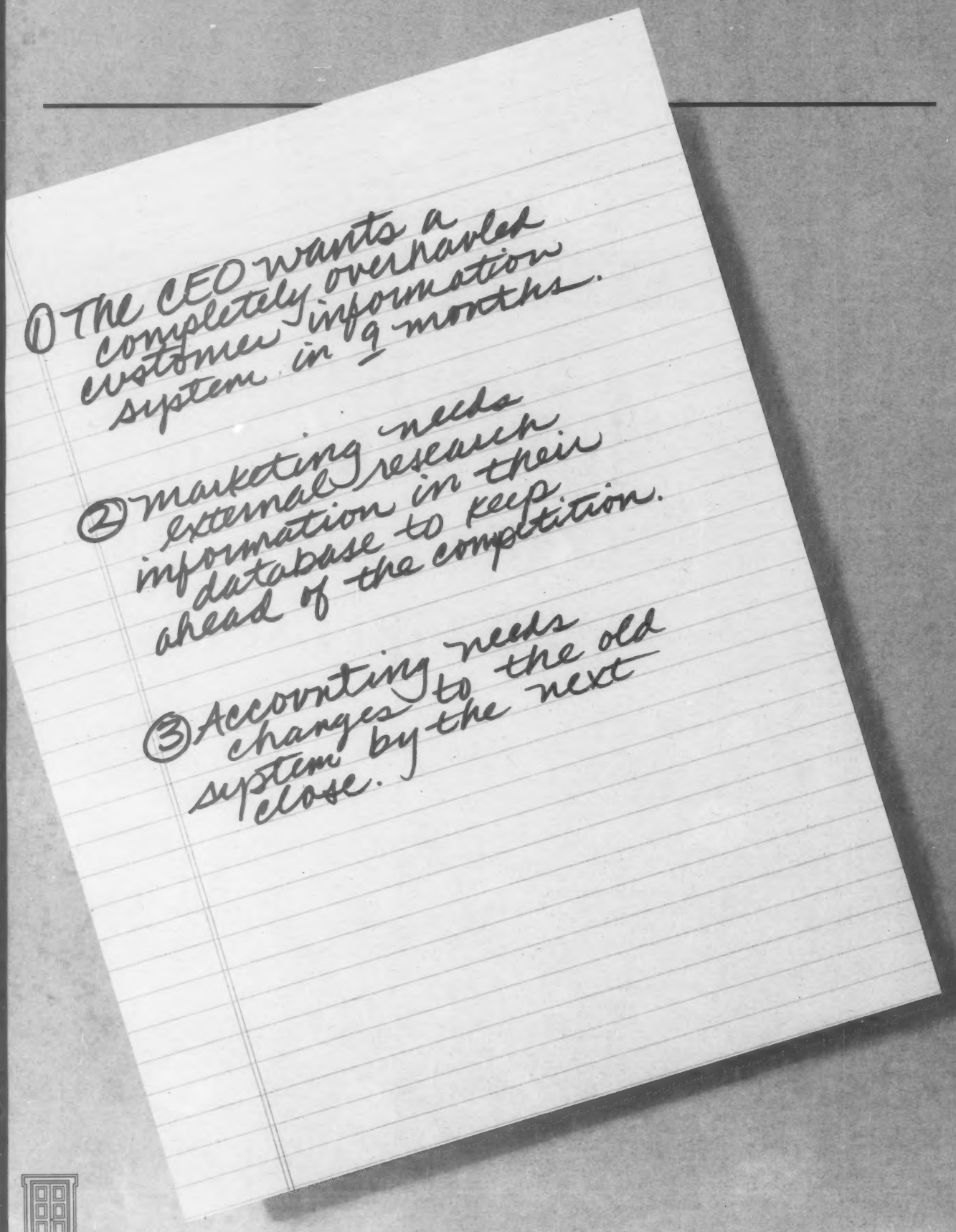
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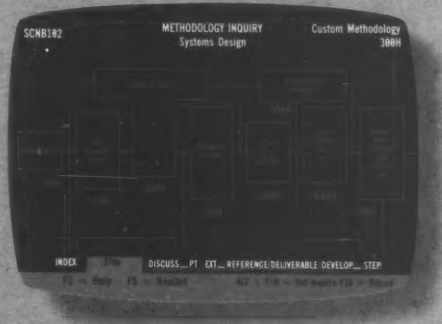

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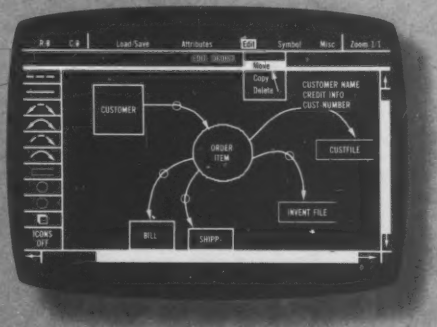

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Circle Reader Service Number 16

Measuring up benchmarks

BY HELEN PIKE

On one of the dog days of summer, a leading computer manufacturer held a press conference in a swank Manhattan hotel. In its bid for a part of the lucrative financial market, the vendor was to issue *real* benchmark numbers that would finally show the superiority of its transaction processing products over its rivals'. But during the question-and-answer period, the bluster turned to blubber when a consultant labeled the figures "skewed," taking apart each claim, benchmark by benchmark, product by product.

Gradually, the temperature indoors grew closer to the 90° heat and humidity outdoors. And so it goes with the brouhaha over benchmarks. Company claims are expected to heat up in the coming months before they cool off, according to Stephen Josselyn, program manager for user services at International Data Corp. (IDC), a market research company located in Framingham, Mass.

"Benchmarking is becoming more of an issue for two reasons," Josselyn says. One, MIS is taking a hard look before purchasing hardware, and two, mainframe sales have slowed considerably. In the fight for those dollars, benchmarking will be a critical weapon, according to Josselyn.

Pike is *Computerworld Focus'* senior writer.

U.S. hardware sales in general, which dipped between 1985 and 1986, are expected to grow only slightly from 1988 to 1989, according to IDC figures. This year, 262,900 units will be shipped for a value of $26.4 billion; next year, 282,600 units will be shipped for a value of $27.6 billion, Josselyn says. These figures are for large, medium and small multiuser systems, exclusive of personal computers.

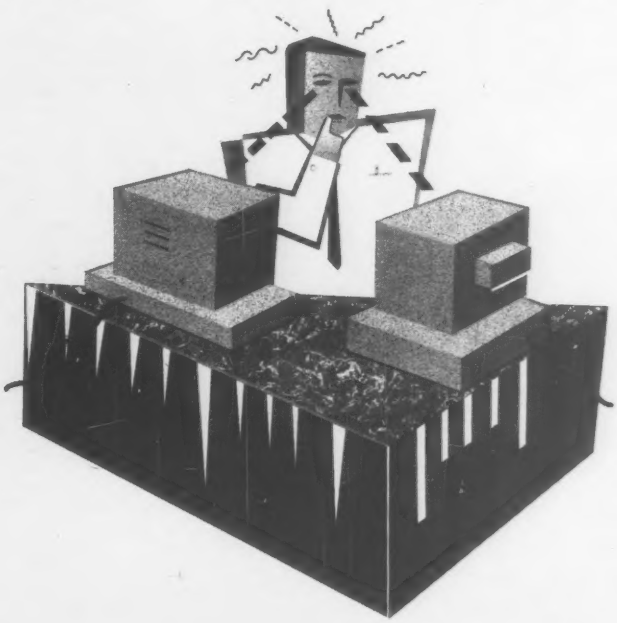
"As MIS looks for more bang for the buck, . . . there will be claims and counterclaims," he says, explaining that the purchasing dollars will be hard fought for among vendors. Their ammunition for getting past the opposition's claims will be benchmarks.

"All [benchmarks] are is a marketing tool," observes Dale Kutnick, an independent minicomputer consultant who has spent the last 12 years in the computer industry.

"It is a way of giving legitimacy to a product that will get the vendor in the door. That's the major point in making them high," he explains.

Once a salesman gets in the door, benchmarks then drop down to about a 20% influence level in clinching the sale, adds the Redding, Conn.-based consultant. "Very sophisticated users will make vendors run benchmarks," instead of having to do them in-house.

One sales representative who has been on the front line vying for purchasing dollars is Susan Ayers, who is in charge of applications market development for Alliant Computer Systems Corp. located in Littleton, Mass. Alliant and its archrival



Convex Computer Corp. in Richardson, Texas, have carried on like the Hatfields and the McCoys of the parallel processor, minisupercomputer market. Ayers says the proof of responsibility lies with both companies "to develop creative compilers that will make it easy for the end user to compile and run code in parallel."

Wall of confusion

"The users are so confused," comments Ayers, whose previous job stints included working for Wang Laboratories, Inc. as manager of design automation. "People are still mystified by [the term] parallel processing. They are scared about RISC vs. CISC. Should they go to workstations or supercomputers? How much work will it require to optimize their codes? . . . The 'dusty decks' have been tweaked too many times."

Benchmarks figure prominently in getting users to look at one company's products instead of the competitors'; to do the benchmarking in-house is a resource strain for the customer, Ayers says.

It is also "a strain for the selling company, which has to analyze what the problem is, what the benchmark will be and what kind of strategy to use," she claims, adding that some surprising side effects may develop. According to Ayers, some customers will deliberately give vendors difficult projects as a benchmark test simply to get the information back in a timely and inexpensive fashion, with no intention of buying a computer.

The honest approach is to determine the number of compute jobs a user can get through in a day, she says, and then determine what the throughput will be: either simultaneous and in parallel or one job all in parallel.

To figure out the time to solution for one processor, the tester must isolate one CPU out of the cluster and test it as a stand-alone to achieve a baseline for comparison, Ayers advises. Or a customer can fire up one job simultaneously with eight other jobs and time it, she explains.

Benchmarking is still key to determining if computers will fit into a computing environment. But that goal goes beyond running a single program off a faster machine. There will be increasing focus on networks, I/O devices, file protection and making the database compatible and the operating system a standard across all computers, Ayers predicts.

The fact remains, at least in Wayne R. Tracy's experience, that "you cannot distinguish the better performing machine from a fact sheet." Tracy serves as product development director for Spacelabs, Inc., a hardware/software supplier of turnkey systems for the health care industry located in Redmond, Wash. He is talking about a recent contract put out by Spacelabs for OEMs to bid on.

"A $300,000 error would have been made if I just relied on specs." Spacelabs sought 100 PCs for which the hardware selection criteria included an Intel Corp. 80386 chip as the base microprocessor, a Unix operating system for handling applications written in C and disk and memory for up to 20 concurrent users. The initial field of five vendors bidding on the Spacelabs contract was reduced to three because of the Unix requirement.

To test the remaining vendors' machines, Tracy used a benchmark designed by the consulting firm of Neal Nelson & Associates in Chicago.

The hare loses out

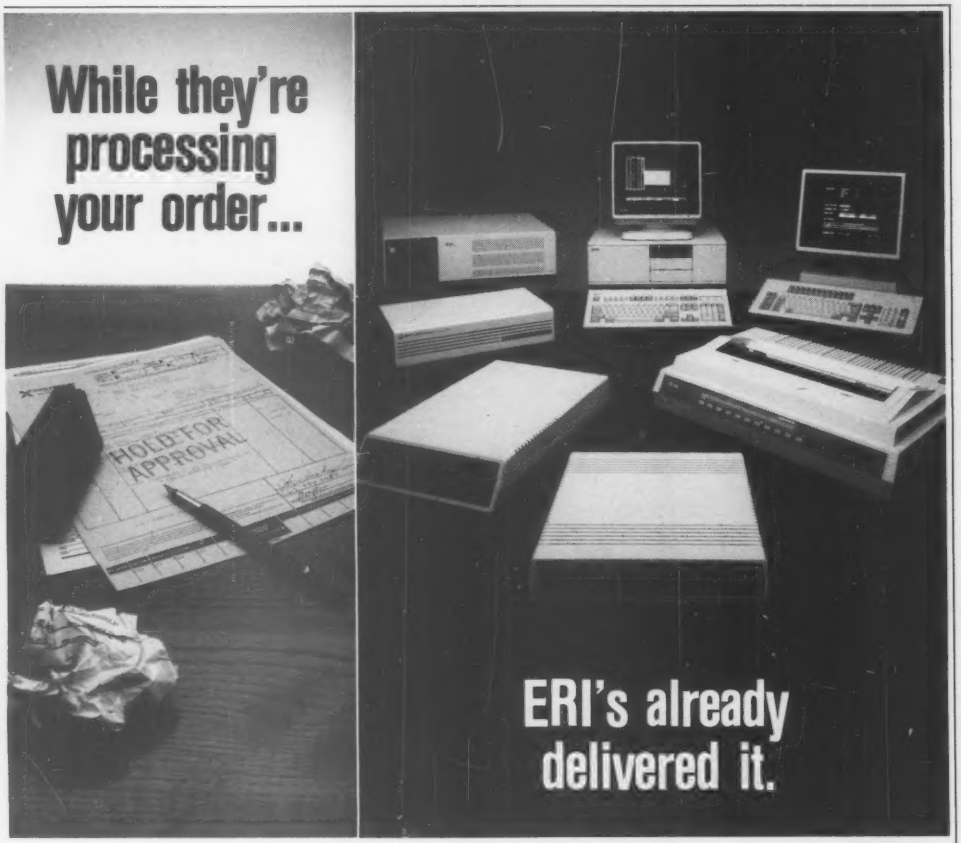
"Usually decision makers want the fastest machine," observes Tracy, who used to be information systems director of the home care division of Baxter Health Care Corp., a Deerfield, Ill., vendor of systems and services to the health care industry. But in this case, the lowest bid came from a firm whose machine had the second fastest speed of the group, because, as Tracy explains, at a 20-MHz zero-wait state, there were no delays in running software. This means "the end user can do more work on the same cycle," he says. The machine Spacelabs did not buy had a clock speed of 25 MHz and a no-wait state.

"The feasibility of executing benchmarks has improved tremendously in the last five years," Tracy states. "Standardizing operating systems [has] made benchmarks practical. Now you can compare costs across hardware platforms."

The battle cry for standards appears to be having an influence beyond just plug-and-play capabilities for products. A few industry participants envision a day when there may be a vehicle that provides objective benchmarking evaluations not unlike *Consumer Reports* or *Road and Track* or the Good Housekeeping Seal of Approval. Consultant Nelson, whose Unix benchmarking studies are used by many, says benchmarking could be the basis for an entirely new niche market to service the end user.

"We're seeing the beginnings of that evolutionary process" as the computer industry moves from a specialty market to a commodity one, he claims. "People have choices, but no way to make intelligent choices. . . . [Until now,] there hasn't been an authoritative source of reliability for computer purchases."

Nelson got into benchmarking as a result of custom programming he began doing in 1973 for clients' financial needs. "We developed our own benchmarks because our customers asked us which hardware they should buy," he explains, adding that he decided to emphasize Unix because of its multiuser capability. To date, Nelson's firm has tested more than 200 Unix products, some IBM OS/2 products and remote terminal emulations.



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Circle Reader Service Number 17

Gauging your own performance

A BENCHMARK BY any other number may be counted differently.

While most in the computer industry are testing the performance of systems and software for the purpose of buying them, a growing number are using benchmarks to gauge their company's productivity.

MDA Scientific, Inc. in Lincolnshire, Ill., makes toxic gas monitoring equipment that combines highly sensitive tapes and proprietary monitoring and measuring instruments. Four years ago, the 19-year-old company had a full product line in place but was only selling five machines from a single product line and 1,000 tapes a month, even though it could list among its customers IBM, Texas Instruments, Inc., Amoco Corp., Dow Chemical Co., AT&T, Motorola, Inc. and Du Pont Co.

After some analysis, MDA's Systems Manager Andy Voss discovered the weak link was a lack of inventory control due to an outdated and simplistic distribution package being used by the materials handling and purchasing group.

Among the company's corrective steps was an upgrade to its system: It bought a Hewlett-Packard Co. Model 3000 Series 39 minicomputer with a six-terminal hookup and purchased a software package from Burlington, Mass.-based Computer Solutions, Inc. called Growthpower. The package offers marketing, manufacturing and financial analysis for growing manufacturing companies.

With Growthpower as the base, Voss established a benchmark that could be effortlessly used by the design and purchasing team and that could take the best advantage of the HP 3000. The benchmark's most salient feature is its list of 26 items that identify the most important aspects of MDA's business such as sales orders, work orders and stockroom transactions.

Then Voss went a step further, putting in high and low limits for each item by using HP's Query Report. The system sends up a warning whenever one item hits its high or low limit in any given week.

The net results are that "in all aspects, we are in control. We spend no time worrying about it until it reaches a limit, and then we know exactly why," comments Donald India, MDA's operations vice-president. Out of the list of 26, only three or four items are flagged in any one week, he adds.

From 1984 to 1988, MDA upgraded its HP minicomputer to a Series 52 with a 64-port capability, increased its support employees by only four and saw sales go from $3 million annually to $20 million, while in-house inventory only rose from $2 million to $2.5 million.

Today, MDA averages 10,000 monthly tape sales and 120 machine sales from five different product lines. MDA is also looking at Computer Solutions' Product Configurator module to help it configure products as a possible addition to its Growthpower implementation.

"Common sense and the desire to know how good we were made MDA do benchmarking," India explains. "It's better than having management or auditors or consultants suggesting to us after the fact what we should do. It has become a measure of how and where we want the company to be." — HELEN PIKE

Measurement terms

WHEN EVALUATING systems performance in a multivendor environment, you're bound to stumble over the apples and oranges dilemma. But by understanding what the measuring tool is, the smart user will have a better grasp of what the measurements mean. The following is a list of some common industry benchmarks and their definitions:

- **Debit/Credit.** This benchmark is a de facto banking industry standard that measures credit authorization transactions. Performance is measured in transaction/sec. Usually written in Cobol, it evaluates everything from local-area networks to mainframes.
- **Ramp C.** This offering evaluates commercial performance of such applications as billing and payroll in transaction/hour. Written in Cobol, it is used by IBM to evaluate its mid-range systems.
- **Millions of instructions per second (MIPS).** The MIPS measurement calculates the execution of a command off a microprocessor. MIPS are used to compare very similar architectures.
- **Whetstones.** This gauge measures floating-point operations and other purely numerical functions on small- to mid-size computers. Whetstones are usually written in Fortran and are most commonly used in the scientific and engineering industries.
- **Dhrystones.** This benchmark measures the non-numeric performance of small- to mid-size computers. Dhrystones can be written in Fortran, high-level C and Pascal.
- **VAX-11/780.** This machine evolved as a de facto unit of measure for DEC's minicomputers used chiefly by the technical community. Performance comparisons are measured in VAX units of performance, or VUPs. For example, a system with a speed of 6 VUPs indicates a speed six times faster than the VAX-11/780.
- **Linpack.** This test measures the floating-point performance of supercomputers, engineering workstations and personal computers that solve equations in linear algebra. Linpack is written in Fortran.

In the future, Nelson says, good benchmarking will clarify the performance controversy, moving the issue from performance to business decisions while moving the mantle of benchmarking responsibility from users and vendors to independent agents.

Omri Serlin, editor and publisher of the "FT Systems Newsletter" and president of Itom International Co. in Los Altos, Calif., also says he hopes that these trends will develop. Serlin says the slings and arrows of benchmarking claims in the online transaction processing (OLTP) market war, for instance, place an unfair burden on Fortune 1,000 information users. They are forced to rely on vendors' claims because their smaller budgets do not allow for independent benchmarking tests, he says. Late in the summer, Serlin launched the Transaction Processing Performance Council to monitor the measure of OLTP performance and to come up with a standardized version of the Debit/Credit benchmark, which comes out of the banking industry and whose fundamental design is based on credit authorization transactions.

This kind of research would have been welcomed by Patrick Zilvitis during his two-year tenure as president of Martin Marietta Data Systems in Bethesda, Md.

"As a vendor to the government, I wish [the government] had specified certain benchmarks so we didn't have to write it all," Zilvitis says. "It costs 100 times as much to perform a real application benchmark with [a vendor's] code vs. to run a standard benchmark."

Without benchmarks, Zilvitis found that decisions were more difficult to come by, particularly when it came to the debate between users who wanted distributed machines vs. the cost of centralization.

"It all comes down to the decision of where to put compute power," says Zilvitis, who now is a manager in Digital Equipment Corp.'s information systems product marketing within the Corporate Systems Group in Marlboro, Mass. "Should you use a remote VAX with vector processing or an IBM in a central data location with vector processing?" he asks, reiterating the never-ending DEC/IBM debate. "Different vendors have different strengths . . . such as I/O or storage.

"You've got to be able to characterize the performance," he continues, advising users to "first find a benchmark that you believe is a reasonable model of your application. Second, in a multivendor environment, have *all* vendors run the same application in order to have an apples-to-apples result."

Real-life reflections

Customers need more standard benchmarks that reflect more real-life examples, he claims, and adds that he would like to see the Debit/Credit benchmark extrapolated to distributed systems, office applications and inventory control.

"Benchmarks need to become more in the public domain . . . because proprietary ones from vendors may give [the originating vendors] an unfair advantage," he says. "The audit community would be a good candidate to take up this cause, like the Big Eight accounting firms or the National Bureau of Standards." But Ken MacMorran, who manages IBM's 2-year-old mid-range performance evaluation center in Dallas, is cautious about the emerging trend for independent benchmarking verification. "It's too early to tell how effective it will be," he claims.

"The whole reason to do [benchmarking] is to propose something that meets the customer's requirement," he says, adding that performance is only one of many buying decision factors.

When IBM runs customer applications at its performance center, Big Blue and the client company are both involved in making code, according to MacMorran, and then "we run a subset of an entire program to give him a feel."

The most important criterion may be defining the work load to be run on a given machine — a fine point that MacMorran says makes the distinction between the Debit/Credit benchmark favored by DEC and the Ramp C benchmark preferred by IBM. While Debit/Credit focuses on banking functions, Ramp C was designed to measure typical bread-and-butter applications such as billing, inventory control and payroll.

"They measure different things," he explains. In the end, the "customer has to net it out and decide what he wants to do with the system." ◆

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ROGER BOEHM

Software's driving force

BY STAN KOLODZIEJ
SENIOR EDITOR

It just might be software's turn.

For years, the computer hardware industry just couldn't do anything wrong. Hardware advances kept rolling along at a steady pace — the microprocessor and the microcomputer, more power for less money and innovative systems architectures such as reduced instruction set computing to push processor efficiency even further.

And it began to appear as though hardware represented the best of what U.S. technical ingenuity could produce.

While hardware surged forward, the U.S. software industry just couldn't get it together. Fourth-generation languages were hailed, made initial progress, then fell back after some well-publicized project failures, such as the one at the New Jersey Department of Motor Vehicles, whose fourth-generation language-based system simply collapsed under the pressure of daily transactions. MIS was not amused. Then came the promise of artificial intelligence, but with few exceptions, AI programs and tools stumbled out of the starting gate.

People said the hardware was there, the computer engines were in place, but they were left idling, lacking innovative software.

In the meantime, there were vicious cycles forming in the data centers of corporate America. Backlogs of applications development requests were piling up at an alarming rate. Many corporations were as much as two years behind in bringing applications to users. Many still are.

Programmer resources were being diverted to maintain old programs, which meant there were fewer resources to spare for crucial new applications. A perception began to form that this mess was attributable to the shortcomings of software and software developers.

But was it? Despite software's failures, many working the software fields today say that software has made, and continues to make, enormous progress on many technological fronts and in many industries.

In fact, many say it's time for software to take some of the glory.

"People are doing some fascinating things in software engineering, but how fast we can implement such things depends on the speed of the hardware available," explains Charles Bachman, chairman of Bachman Information Systems, Inc., a Cambridge, Mass.-based developer of computer-aided software engineering (CASE) tools. "In many cases, software is ahead of the existing hardware."

Bachman also is critical of those who would propose that there is something intrinsically wrong with the U.S. software industry. "It's like yelling fire in a crowded theater," he says. "It's irresponsible and only causes trouble."

How productive is your software? Function Points can tell you. Page 36.

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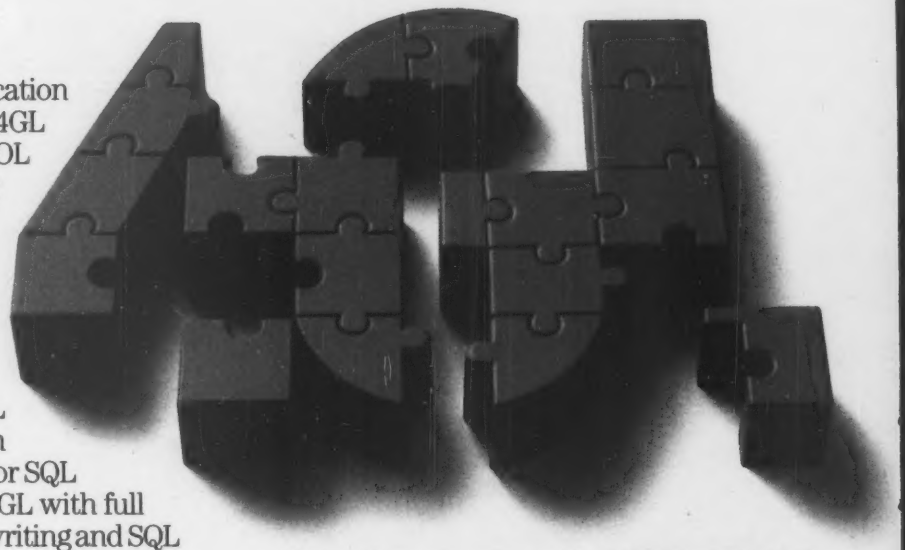

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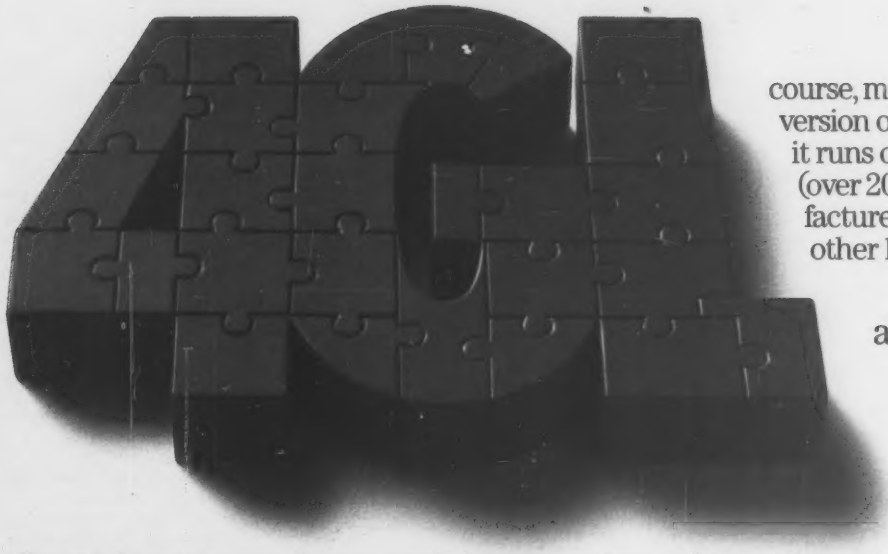

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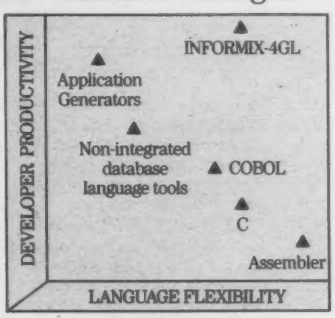

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don't have to look far for it. Take the corporate applications backlogs that by some estimates are growing by as much as 45% a year. According to Tom Scott, director of marketing development at Promod, Inc., a Lake Forest, Calif., supplier of software engineering tools, maintenance of existing programs takes as much as 80% of some of his clients' data processing time, leaving little time to work on creating applications. And they're not alone.

The short-term result of the applications backlog is a drag on the ability of corporations to move ahead with computer projects. The bigger picture includes lost productivity as U.S. corporations are mired in untangling the problems and inefficiencies of past programmers.

The scale of this problem, however, has acted as a magnet, attracting the best software development talent in the past few years. These engineers know that the potential monetary payoff for good, innovative software that can make a dent in the backlog is big.

MIS is willing to pay for help. The Technology Research Group, Inc. in Boston and L. F. Rothschild & Co. in New York recently surveyed U.S. software developers and concluded that MIS budgets for software development tools are increasing significantly, growing more than 35% between 1986 and 1988. Equally significant, the survey results indicated that 61% of the MIS managers contacted said they are actively seeking new software tools.

Many of those tools are here in the form of CASE products.

All flavors and colors

CASE is best known as a set of tools that integrates all phases of software development, from design and prototyping through coding and maintenance. CASE offerings comes in all flavors and colors, but they aim at the same thing: getting the design and prototyping as close to perfection up front, thereby cutting down on back-end maintenance, freeing up programmers to work on new projects and cutting costs down the line. The keystone of CASE is structured development.

Though the brunt of CASE concentrates on program development, there are a number of splinter CASE technologies emerging.

Two growing branches of CASE, reengineering and reverse engineering, aim at cutting to the core of existing programs and extracting their structural essence. With this information, programmers can streamline the existing programs, making them easier to maintain. Programmers can also use the information to better construct new, adjunct programs that will work closely with old programs.

Howard Fineman, director of software at the Catalyst Group, a division of Peat Marwick, Main & Co. in Chicago, explains the two concepts: "Software reengineering takes the code from an existing program and restructures it to ease the maintenance burden on it and make it easier to enhance. Reverse engineering takes the data relationships from the restructured program, moves them to an applications generator and creates new programs."

Nice and neat. Such engineering tools also enter the important, and sometimes controversial, area of reusable code. Important, because reusable code is at the heart of the entire issue of modular, or structured, programming, which many think is a productivity catalyst for U.S. data centers. And controversial, because some U.S. researchers have criticized MIS in the U.S. for being tardy in its use of modular programming.

To structured/modular programming, any sort of waste is anathema. The axiom is to create as many parts, or modules, of a program that can be used again in future program development so programmers don't have to keep reinventing the wheel.

"We've been working with reusability [of code] for years," explains Jim Mackintosh, systems vice-president of the technology department at the Hartford Insurance Group, an insurance company headquartered in Hartford, Conn. Mackintosh says that his company's homegrown CASE tools have been used in the development of such mainstream insurance applications as personal and commercial lines and life information systems.

Mackintosh adds that the tools are used to handle everything from data repositories, systems application architecture and reusable code.

"Reverse engineering is a hot area for us now," he says. "We haven't funded a lot of new development lately, and probably 80% of our programming resources are tied up in [program] maintenance. We see substantial payoffs with things like reverse engineering and reusable code in the future."

In the space race

So do a lot of other organizations, including The Software Productivity Consortium (SPC). The SPC is a research collection of 14 U.S. aerospace companies formed in 1985 and based in Reston, Va. The consortium regards particular concepts such as reusable code — and CASE technology in general — as essential in keeping the U.S. aerospace industry ahead in world competition. Its research, in fact, will extend into the Reagan administration's proposed Strategic Defense Initiative, should that effort clear Congress.

Bob Cowan, the SPC's public relations manager, explains that the consortium has been developing CASE tools to build specific applications involving real-time embedded software systems that are essential in flight systems, fire control, navigation and radar. Many of these software engineering tools are developed in-house, Cowan says, because a good deal of the software developed at SPC is embedded in specialized hardware, not exactly a staple of the commercial marketplace.

"Two of the principal underpinnings of our program are the concept of software prototyping and the concept of software reuse," Cowan explains, adding that the SPC is scheduled to introduce its first software engineering tools in early 1989.

Reusable code is also a hot topic in the hallowed halls of MIT in Cambridge, where researchers in the school's Artificial Intelligence Laboratory have been sponsored for years by the likes of the Department of Defense, the National Science Foundation and IBM to find the secret of reusable code.

That task is not easy. One MIT project, the Programmer's Apprentice, has set for itself the lofty goal of "developing a theory of how expert programmers analyze, synthesize, modify, explain, specify, verify and document programs." Part of the Programmer's Apprentice, according to professor Richard Waters, one of the project's principal researchers, is a system called Cake, a reasoning system aimed at helping a programmer logically use a library of common program forms and implementation methods to construct new programs. Reusable code.

Software factories

On a more global scale is the research undertaken by Michael A. Cusumano, an assistant professor in MIT's Sloan School of Management.

For several years, Cusumano has been studying the concept of software factories. Software factories, as the name indicates, deal with very large-scale software systems development. These factories emphasize a structured approach to development and management. Although these systems are now usually associated with Japanese corporate mainstays such as Hitachi Ltd., Toshiba Corp. and Fujitsu Ltd., Cusumano says that originally, in the 1960s, software factories were an integral research item in such U.S. companies as System Development Corp., TRW, Inc. and Boeing Co.

Software factories stress the development and capture of large blocks, or modules, of reusable code. The Japanese have successfully melded software factories with their own methods of large-scale software production, which tend to break up a project into big blocks of linear sequence, with each block tackled by a team of programmers. Consensus rules, and the tendency is to override the egos of individual programmers.

The software factory is as much a management issue as it is a technical one. In the U.S., where software programming has always been considered more of an art than a science, the idea of programmer as individual has achieved an almost cult-like status, even in the largest program developments in which teamwork is essential.

In the '60s, such ground proved barren to the software factory concept. But that could change. Although Cusumano admits that the intrinsic management differences between Japanese and American companies are still too great to enable software factories to take root in the U.S., more large U.S. companies are under pressure to study and adapt any concept that might lead to more structured programming.

"One of the things about

Standards craze hits CASE, too

WITH STANDARDS JUST about everywhere in the industry, it's no surprise to see some movements under way to standardize the way various CASE and software engineering tools work and communicate with each other.

The CASE Interchange Standard subcommittee is a subset of the Electronic Design Interchange Format (EDIF) committee, part of the Electronics Industries Association. EDIF is a proposed communications protocol for electronic design software. The EDIF/CASE subcommittee wishes to use EDIF as a base for its own proposed interchange standard.

"The EDIF/CASE work is a preliminary stage in the standardizing of CASE," explains Gary Greenfield, senior vice-president at Sage Software, Inc., a software developer and member of the EDIF/CASE subcommittee. "A good number of vendors will build CASE compatibility around IBM's proposed data repository specs, but the smaller vendors who can't afford such a large project will use the EDIF/CASE specs."

Considered more extensive than EDIF/CASE is the proposed CASE Integrated Project Support Environment (IPSE) standard being presented by Digital Equipment Corp. and Atherton Technology, the Sunnyvale, Calif., developer of IPSE. According to Steve Wells, Atherton's director of marketing, IPSE links software tools used in large-scale development projects and also monitors, tracks and coordinates work across the software development life cycle. What IPSE backers propose is building a de facto standard at the heart of computer-aided software development.

Wells claims that a number of other software developers, such as Hewlett-Packard Co., Cadre Technologies, Inc., Index Technology Corp. and the Software Productivity Consortium, have expressed an interest in building around IPSE. He also admits that having a big company like DEC backing the effort doesn't hurt.

"I think users want stability in software development," Wells says. "If things are more stable in software engineering, things will move forward." — STAN KOLODZIEJ

software factories that intrigues the West," Cusumano says, "is the remarkable [software] productivity gains Japanese companies have experienced with them. The bottom line is that a lot of Japanese projects using the software factory concept come in on time."

Cusumano says he has uncovered some impressive figures coming from software factory research. Toshiba claims that 55% of its software is now made up of reusable code. Some Japanese companies, such as Hitachi and NEC Corp., claim programmer productivity from five to 10 times that of U.S. counterparts. And TRW says it has discovered that roughly 60% of all the software it has been writing is redundant and ripe for reusable code.

The differences between U.S. and Japanese computer markets are not all cultural, however, Cusumano says.

"Roughly 95% of Japanese large systems software is customized," he says. "As a result, in the past few years there has been tremendous pressure in Japan to standardize and rationalize software production."

On the other hand, Cusumano says, U.S. corporations conduct much more in-house software development.

The result is that corporations in both cultures are trying to maintain their software strengths and eliminate weaknesses. More U.S. corporations, for example, are concentrating on emphasizing teamwork in their software development, something at which the Japanese excel. Japanese companies, on the other hand, are trying to follow their American counterparts and place more emphasis on developing reusable software code and techniques in-house rather than relying on the more specialized, custom programs developed by third parties.

Both IBM and Microsoft Corp. have expressed interest in the software factory concept for their own software product development. Also on their lists is object-oriented programming.

> **"The bottom line is that a lot of Japanese projects using the software factory concept come in on time."**
>
> MICHAEL A. CUSUMANO
> MIT SLOAN SCHOOL OF MANAGEMENT

"Where these languages are great is in identifying programming objects," explains Bruce Lynch, president of consulting firm Software Developers Co. in South Weymouth, Mass. "Object-oriented programming enables programmers to automatically carry certain parts or modules forward at each stage of the [program] development cycle. That's good, because it keeps the programmer's mind from hardware-oriented concerns. Languages like C++ are good at producing specific user programs and for maintaining structured programming."

Object-oriented programming languages have had a long and somewhat checkered history. Smalltalk, a child of Xerox Corp.'s Palo Alto Research Center, is generally regarded as the first object-oriented programming language. Ironically, Smalltalk's subsequent general failure was in some respect attributed to the unavailability in the late 1970s of powerful microprocessors to handle Smalltalk's resource requirements.

Experiencing better commercial success, however, is C++, an object-oriented language from AT&T Bell Laboratories.

The sudden interest in object-oriented programming can seem puzzling at first. These languages are generally slower to program with than more traditional languages like Cobol and Fortran. Because object-oriented languages can eat up CPU resources and cause excess programming overhead, it cannot be said that such languages are machine efficient, although major increases in hardware microprocessor speed have lessened that concern.

Despite such drawbacks, object-oriented languages are making converts.

Take the case of Dr. James Coggins, a professor of computer sciences at the University of North Carolina in Chapel Hill. Coggins has been doing research for several years in the field of image pattern recognition. Before coming to the university, Coggins developed image recognition software programs running over Digital Equipment Corp.'s VMS operating system. When he left for the University of North Carolina, Coggins took his software programs with him.

"Going from a [DEC] VAX VMS environment to a strictly Unix and C programming school was traumatic," Coggins explains.

Coggins came across C++ when a fellow professor asked him to research the programming language and teach a course about it. It was love at first sight. Using AT&T's C++ Compiler, Coggins set about redesigning and rewriting his image pattern tools from scratch.

'Discipline and structure'

"Object-oriented design could put order into my software system," Coggins says. "The compilation time took longer than C, the execution time was a little slower, but in the end it was easier to write correct code. C++ provided needed discipline and structure to my programming."

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Function Points: A measuring stick for software

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In 1979, A. J. Albrecht, an IBM researcher, came up with his Function Point metric, which has become the Magna Carta, if you will, of the software measurement crowd.

"What Albrecht did with his Function Point matrix is estimate how long it would take to program a simple screen vs. a complex screen, how long to define a file and so on, down a long Cobol programming list. All of these tasks are worth certain Function Points," explains Anthony Picardi, manager of quality programs at Cortex Corp., a Waltham, Mass., CASE systems development firm.

Picardi says he has spent years comparing projects using Corvision, Cortex's DEC VAX-based CASE system, with similar programming results using Cobol. Function Points were the measuring tools to calculate programming efficiency between the two environments.

Don't look for Function Points to light up any excitement boards, but their prosaic nature belies a certain eloquent simplicity and directness much needed in an industry overrun by vendor hyperbole and productivity claim jumping.

According to Capers Jones, chairman of Software Productivity Research, Inc. in Cambridge, Mass., "Function Points behave consistently, that's the big factor. Measuring productivity only by lines of code is invalid; it is as invalid as a surgeon performing an operation without sterilized instruments."

In themselves, Function Points are meaningless, Picardi says. But if everyone uses the same numbers or tools to measure, these numbers suddenly become legitimate tools to gauge the progress of several design systems.

In Britain, a revised set of such Function Points has already been standardized, and Jones claims that he has counted more than 300 U.S. software developers that have expressed an interest in doing the same in this country.

There are drawbacks to this method. Picardi and Jones, for example, say it is often a tough chore convincing MIS managers and programmers to fill in the blanks on measurement charts.

"We wrote up a little Function Point handbook with which clients could do some software analyses, but developers said they had been programming for so long that they knew how long things took to complete," Picardi says. "They say they don't need to measure, that they know it intuitively."

Andy Sills, assistant vice-president of strategic projects at United Telecommunications, Inc., a communications vendor in Kansas City, Mo., says that in his experience with Function Point analyses, there is still too much leeway for users to impose tests and interpret the results differently. "It's possible for two separate individuals using Function Points to measure the same project and come out with some disparity in results," Sills contends.

And Jones says two other problems with Function Point measurement are cost and time.

"It takes 2½ to four hours per project to collect all the data that has to be collected, and you need data from several projects," Jones claims. "It's as expensive as an audit." — STAN KOLODZIEJ

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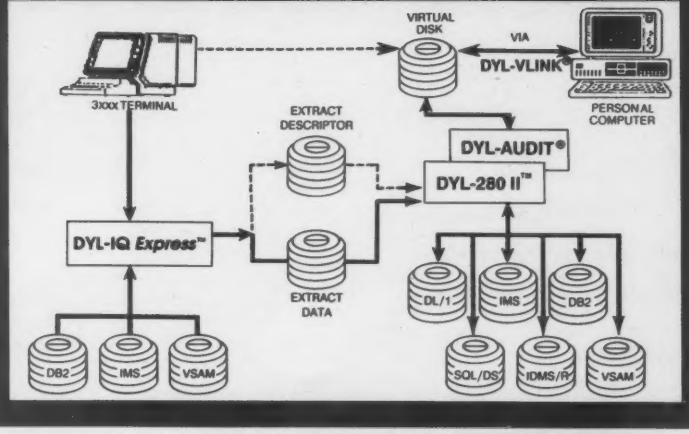

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Consortium says that object-oriented programming is also an integral part of the work at the SPC, where the languages are being used to produce systematic design for certain aerospace applications.

When you look around, the market is not limited in presenting software ingenuity. Mary A. Modahl, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., for example, says she has seen a definite increase in the number of corporate departments taking the initiative with advanced software development tools to develop their own software and avoid the data center backlog lists. Software house Data Kinetics Ltd. in Ottawa located a direct-access storage device bottleneck that was slowing down on-line transaction processing in the brokerage industry.

Acting on this, Data Kinetics produced Tablebase, mainframe software that more efficiently handles I/O functions in memory, increasing throughput.

Spared one expense

Another company, SDI in San Mateo, Calif., has developed software that uses main computer storage to increase computer execution speed, obviating the need for MIS to buy expensive CPU upgrades. In the area of pattern recognition, a company called Linus Technologies, Inc. in Reston, Va., took 4½ years of programming in C to produce innovative software that can recognize and replicate hand drawings and writing, all fitting into personal computer-size memory. The list goes on.

> **Many companies now say they believe that much of the steam (and excitement) has left the hardware industry. The hot button for the '90s just might be software.**

Many companies, in fact, now say they believe that much of the steam (and excitement) has left the hardware industry. The hot button for the '90s just might be software.

"When you think about it, hardware considerations aren't that important anymore," maintains Gary Greenfield, senior vice-president of Sage Software, Inc., a Rockville, Md., software engineering vendor. "Who cares if it has parallel processing. Hardware is a commodity. Software is powering systems now. Now it's software's turn."

Maybe, in a sense, things are indeed coming full circle.

Actel Corp., for example, a Sunnyvale, Calif.-based firm right in the middle of the expanding market for custom chip design systems, has spent several years refining the important logic design software necessary to lead an engineer through delicate gate array chip development using Actel's system.

"There are hundreds of thousands of interconnect points on these chips, and it's just not possible for engineers to get involved with an explicit description of how to connect everything," explains Amr Mohsen, Actel's president and chief executive officer. "The software does that in a transparent way. The days of handling chip design manually are gone."

Actel's software runs on micros built around Intel Corp.'s 80386 microprocessor. In the eyes of many, the 386 processor is itself being credited with bringing good chunks of large systems software design down to the micro level.

And Mohsen says he enjoys the irony of the situation, whereby a system like Actel's, which has advanced software running on advanced hardware, will enable still further advances in hardware design.

In an industry that has questioned the validity of software's pace of evolution, it is software that is now on the verge of redesigning the face of hardware in the coming decade. ✧

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What will standards bring?

BY PHILIP J. GILL

There is a standards movement afoot. Industry groups, each with its own unique perspective and involvement, are shouting for standards and declaring that conformity will significantly improve the computer industry. Sure, numerous details must be addressed, such as deciding which standard to back and how to mesh the various winners into a comprehensive whole, but once those points are worked out, nirvana will result, right?

Not necessarily. While the need for standards cannot be disputed, the changes that this revolution will bring are still up for debate. Issues such as cost, quality and competition that will deeply affect users and vendors must be resolved. Until then, it is difficult to pinpoint what life will be like after standards.

It will be at least 10 to 12 years before today's industry standards, many still under development, are stable enough and widely accepted enough to form the basic building blocks of computer systems, software and communications.

Even then, industry executives involved in various standards efforts say, existing standards bodies will not have disappeared but merely evolved. For example, they suggest that, in the year 2000, instead of debating about operating systems and user interfaces, standards bodies and the marketplace will be speculating on data interchange and portable application development tools.

Nevertheless, today's standards efforts promise to deliver the basis, if not the reality, of a brave new world of computing.

To determine what effect standards will have on the computer industry, *Computerworld Focus* asked four industry veterans experienced in different areas of standards efforts — Alex Morrow, Robert Ackerman, Roger Sippl and Charlie Bass — how they envision the future.

Morrow is director of strategic relations for the Open Software Foundation (OSF) in Lawrence, Mass., an effort by leading computer vendors, such as IBM and Digital Equipment Corp., to create and promote an open architecture based on Unix. Ackerman is president of San Francisco-based X/Open, an international consortium of computer and communications vendors seeking to establish computer-aided software engineering (CASE) standards. Sippl is chairman of Informix Software, Inc., a Menlo Park, Calif., database and application development software house. Sippl also serves as chairman of the X/Open Independent Software Vendors Advisory Committee and was a founder of the /usr/group, a Santa Clara, Calif.-based association of commercial Unix system vendors that has been instrumental in developing Unix and the federal government's Posix standards. Bass, a

Gill is a San Mateo, Calif.-based free-lance writer and editor specializing in business and high technology.

Experts agree: Life won't be the same

cofounder of Ungerman-Bass, Inc., is chairman of Touch Communications, Inc., a Scotts Valley, Calif., communications software firm building products based on the emerging Open Systems Interconnect model.

The following is what these experts predict will be standards' legacy:

• Today's vision of intelligent desktop workstations connected to vast networks of databases, information servers and global communications will become a reality.

In fact, they predict that intelligent desktop workstations with sophisticated, graphics-oriented user interfaces, icons and mice will be standard fare, not the exception. Character-based terminals will rarely be seen and even more rarely be used.

The OSF's Morrow predicts that vast global networks of information databases and communications lines will be as accessible as today's telephone network, and home computers will be as ubiquitous and easy to use as today's television sets.

Moreover, because graphics capabilities will have advanced to the point at which freeze-frame video is possible and reasonably priced, computers and televisions will be largely indistinguishable, at least in the home.

• It will be easier to construct and interconnect large-scale networks of diverse computers, including workstations, personal computers, minicomputers and mainframes.

For MIS directors and information management personnel, this ease of integration will free them to concentrate on providing solutions to business problems that help a corporation compete, rather than on the basic issues of interconnection.

• Graphics-based user interfaces will be the norm for virtually all applications, both personal productivity tools, such as word processors and spreadsheets, and more industry- or company-specific applications. Those graphics-based interfaces will be largely the same across the applications spectrum.

• A new information model will emerge. Informix's Sippl, in fact, insists that a new information model will have to emerge, one that will merge the traditional concepts of a database and a file system.

Today's databases are limited to characters and integers in the types of information they can store and retrieve. Databases in the year 2000, however, will have to accommodate images and large volumes of text. These data types are currently stored in a computer's file system.

Sippl predicts a merger of the two through new extensions to the traditional relational database model.

Work on standardizing these extensions, he says, will not get under way for at least five years.

• Software applications will be easier to create and customize, blurring today's distinctions between programmers and knowledge workers. In fact, Sippl estimates that the current professional or knowledge worker who uses a computer on the job already spends 10% to 15% of his work time involved in system customization.

Typically, today's knowledge worker directs a programmer to do the customization work. In the future, programming tools will be easy enough and sophisticated enough to allow office workers to do their own program customization. That will free up programmers to work on large-scale, corporatewide projects rather than personal-type applications.

• Another change expected to take place will be that systems will surely be less expensive, as hardware and software become commodity items.

However, that effect would come about regardless of the standards movements, given the computer industry's historic price/performance curves.

• The nature of competition in the computer industry will change. For one thing, there may well be fewer hardware manufacturers than there are today. With most systems based on standard building blocks, including standard microprocessors, cost advantages in manufacturing will shift to those with the

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greatest economy of scale in manufacturing.

That's not to say these giant manufacturers will dominate the industry. All the members of *Focus'* panel agree that as the movement toward standards provides common hardware, software and communications platforms, the balance of power will shift from hardware manufacturing to those vendors providing solutions.

However, vendors will really have to deliver the promised solutions, because a large part of what one vendor sells will be available from almost every other vendor as well. Software — in particular, tailored or highly customized software — will become the key to a successful system or product offering.

X/Open's Ackerman predicts the successful computer vendor in the year 2000 will more closely resemble today's system integrator than today's computer manufacturer.

Because systems will be so similar, vendors will be forced to refocus their efforts to differentiate themselves not on such traditional criteria as product features and performance but on custom software, integration, service and support.

Ackerman downplays warnings that vendors can't or won't respond to this type of challenge and that innovation will be lost.

He points to Sun Microsystems, Inc., the Mountain View, Calif., workstation manufacturer. Sun may not be a prototype of the new standards-based computer manufacturer, but it serves as a good test case. And a very successful test case at that, Ackerman adds, noting that Sun has had one of the fastest rises in Silicon Valley history, going from a start-up firm to a $1 billion-a-year company in about six years.

• Proprietary systems won't disappear, although their importance and market share will diminish.

The only major area of disagreement among the four experts has to do with whether these changes are destined to occur. After all, it is quite possible that all, part or none of these predictions will come true.

Ackerman, Morrow and Sippl insist that industry standards are an idea whose time has come and that standards' rise to prominence is as inevitable as death and taxes.

"We're on the top of the slope looking down," Morrow contends. "I don't kid myself that there won't be other alternatives [to OSF] . . . it's an inevitable process."

Ackerman is more vehement. "In some cases today, proprietary systems are bottlenecks to progress," he claims.

However, Touch's Bass, a long-time player in the networking standards arena, disagrees. While he explains that it's not that he wants standards efforts to fail, he does insist that that is still possible. "They can fail if they take too long or don't provide anything of practical value to the industry," he warns.

Bass also says another big worry is that the current drive for standards might upset the traditional balancing act in the computer and communications industries between standards and innovation.

"Standards are a step-by-step process, while technological breakthroughs are quantum leaps," he says. "We enjoy an environment where both are possible and go on in parallel."

So while standards allow computer vendors to stop reinventing the wheel, every once in a while an innovation comes along that sweeps past what's available and provides a significant benefit or improvement, Bass explains.

As an example of that phenomenon, Bass points to the current crop of reduced instruction set computing-based microprocessors as offering price and performance far superior to today's standard architectures, such as IBM 370-type mainframes, Digital Equipment Corp. VAX minicomputers and Intel Corp. microprocessors.

The trick for future technologists will be to maintain the balance between standards and innovation and to nurture that environment. ◆

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TECH TALK

Out of the closet: IDE growth follows CASE market's lead

By T. J. Wise

Software productivity is surely the chief paradox, and leading gripe, of the age.

Talk to a dozen MIS managers, and you'll get a dozen different chief concerns. For some DP people, it's connectivity that's the big deal. For others, hardware upgrades. For still others, the beef is the budget.

But the one thing they have in common is shared concern about software productivity. It may not be the problem that keeps them up nights, but it is a nagging sort of concern, like a low-grade fever or a crossword puzzle left unfinished on the breakfast table.

How is it possible, everyone wants to know, to increase the quantity of software that programmers write without losing quality?

Recently, computer-aided software engineering (CASE) has been the solution most often proposed by the industry. In particular, graphically oriented front ends to CASE tools have been hot, particularly those that run on workstations.

Why did IDE's Wasserman finally take the money offered him?

But does CASE (let alone CASE on a workstation) really have a place in MIS?

The answer to that is still unclear. But we may have gotten a strong hint at an answer in the last few months via Interactive Development Environments, Inc. (IDE) in San Francisco. IDE sells Software Through Pictures, a CASE product that runs on Unix and DEC VMS-based workstations from the likes of DEC, Hewlett-Packard, Sun Microsystems and Apollo.

Software Through Pictures is actually a collection of tools primarily (though not exclusively) meant for systems analysis and documentation. The idea is that if a programmer gets down exactly what he wants his program to do and when, then the actual writing of the code will be a snap.

Thus Software Through Pictures includes several graphically oriented editors — a Data-flow Diagram Editor, a Data Structure Editor, an Entity Structure Editor and so on. These elements let you sketch, in detail, what the program is going to look like long before a line of code sees the light of day. It is the kind of capability that CASE supporters call a step toward the total automation of software and that critics call a million-dollar flow chart stuck on the front of a CRT.

But no matter what your opinion of graphically oriented interfaces and CASE, IDE is significant because, until a few months ago, only a select few had ever heard of it, which isn't to say that IDE is a start-up only now gaining recognition. It is, in fact, old. It was founded in 1983 by Anthony Wasserman, who was a professor at the University of California at San Francisco at the time and is now company president.

In fact, IDE is older than most of its competitors, including those that have overshadowed it for years. Providence, R.I.-based Cadre Technology, Inc., for instance, is the name that usually comes to mind when the subject of workstation-based systems analysis tools is mentioned. Yet despite its market dominance, Cadre is actually several years IDE's junior.

This situation is all the more puzzling because IDE has not been without would-be customers and would-be investors. For years, the venture capital community regarded IDE as a marvelous bet. Venture capitalists were phoning Wasserman rather than the other way around. He constantly declined their money.

It was only this year that Wasserman accepted the aid and comfort of well-funded venture capitalists. New marketing staff was brought in from several much larger software firms, such as database management system maker Oracle, and, quite suddenly, Cadre has started to see some real competition for some of its accounts.

Why did Wasserman finally do what people had been urging him to do since 1983 and take the money offered him? It is in the answer to that that IDE gets interesting to MIS.

Continued on page 42

Wise is a Boston-based writer specializing in up-and-coming technologies.

PRODUCT CLOSE-UP: CASE DESIGNER

Oracle interface bows

Oracle keeps those computer-aided software engineering (CASE) products rolling out. CASE Designer is the Belmont, Calif., company's third CASE product, joining CASE Method and CASE Dictionary in Oracle's troika of CASE design and analysis tools.

Alex Mollen, Oracle's product manager for CASE tools in the U.S., said that CASE Designer is a graphical interface to the information contained in CASE Dictionary, which is the place where analysts and designers record and maintain their system requirements and design decisions.

Whereas CASE Dictionary already comes with a forms-based interface, Mollen said, CASE Designer enables developers to access the same information using techniques such as mouse-driven drawing, pull-down menus and multiple windows.

"You have to look at CASE Designer and Dictionary in conjunction," Mollen explained. "Designer doesn't really store diagrams itself but interprets them and passes the diagrams on to the Dictionary, where they are accessible to all users."

Measurement tool predicts project's cost, effort and quality. Page 43.

Mollen added that CASE Designer contains a matrix diagrammer that enables analysts to establish a relationship between any two elements, such as functions and data, for example.

CASE Designer needs powerful graphical workstations with high-resolution screens such as IBM Personal System/2 Model 80s and Sun Microsystems, Inc. workstations, Mollen said. That

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BLUE BEAT

PS/2 missing link

Brian Jeffery

Looking at the current IBM Personal System/2 line is like looking at a jigsaw puzzle with half the pieces missing. There is a lot of capability in the architecture that clearly hasn't surfaced yet and, in some cases, will not surface for years.

IBM hasn't clarified what is missing, which is unfortunate, because the missing pieces are going to have a great impact on everyone — users, software developers and clone makers.

Let us start with the pieces that are there.

First there are the low-end, non-Micro Channel Personal Computers, which now include an Intel 80286-based box. These machines are easy enough to figure out. They are general-purpose PC-DOS ASCII PCs designed for the less sophisticated user who does not want or need mainframe connectivity.

Then there are the Micro Channel Personal System/2s, and this is the area in which the missing pieces begin. There are 80286-based Models 50, 50Z and 60 and Intel 80386-based Models 70 and 80. The 386-based models use an IBM custom version of the Intel 32-bit processor that IBM described in April as "80% proprietary." But the Models 70 and 80 don't do anything that can't be done with a 286 and, in fact, run IBM software in 286 mode.

Then there is the Micro Channel bus, a nice piece of technology that IBM says took years and a corporatewide effort to develop. Right now, though, it provides little real functionality beyond what a user can already get

Continued on page 43

CASE modules for the masses

Low-price offerings seek to grab 10% of market

Feel that computer-aided software engineering (CASE) products are just too big, too expensive and aimed exclusively at large computer systems?

If so, Computer Systems Advisers, Inc. (CSA) in Woodcliff Lake, N.J., may change your mind. CSA has just launched Picture-Oriented Software Engineering (POSE), a series of nine personal computer-based software modules that CSA claimed addresses the front-end planning, design and analysis phases of application development.

POSE's total price is $885 per set of four data-driven and four process-driven software modules. CSA also said that individual modules will be introduced with a limited-time special offer of $295 per software module.

Sherman A. Drusin, CSA's president, has set an ambitious goal for his company and, in the meantime, challenged competitors in the CASE arena. Drusin is confident that his upstart firm will own 10% of what he projects will be a $1 billion market by 1992. So certain is he of POSE that CSA is also offering customers an unconditional money-back guarantee, the first CASE company to do so, Drusin claimed.

Glitz and glitter

Drusin conceded, however, that POSE has been subject to some marketing pizzazz.

"We're breaking into a [CASE] marketplace that is heavily populated, and we have to do something dramatic," Drusin explained, referring to the aggressive pricing and money-back guarantee. "But POSE is going to open up CASE technology to those corporate departments that couldn't afford CASE before. That's what the market needs."

POSE runs on IBM's Personal Computers, Personal Computer XTs and ATs and Personal System/2s and compatibles. POSE also supports IBM's SQL/DS and DB2 as well as Software AG of North America, Inc.'s Adabas relational database formats. The nine POSE modules cover a range of CASE analysis and design techniques, such as data modeling, data flow and decomposition diagramming, program structure charting and logical access path analysis.

The screen and report prototyping module is scheduled for delivery this fall, according to CSA. — STAN KOLODZIEJ

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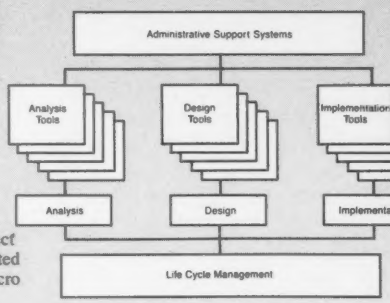

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Tech Talk

Continued from page 41

Prior to 1988, IDE's market was limited. The company sold to the big research firms, aerospace companies, research and development labs and so on — in short, all the organizations that regularly deal with very large software projects. That group is small, and IDE didn't need or want much in the way of a marketing staff to serve it.

But now, all that's changing. CASE in general is beginning to appear in mainstream computing — in, that is, the many thousands of computer installations across the country. And IDE is being drawn into these mainstream installations, whether it wishes to be or not. Quite suddenly, it needs a marketing staff, one that can only be put together with venture capital.

It says much about the nature of the new markets that IDE is being forced to reshape its product to reflect MIS requirements. In particular, Software Through Pictures has recently taken on the ability to deal with SQL. It is also being given the power to design databases.

In short, IDE's history may signify that CASE, and graphical CASE, to boot, looks to be in MIS for the long haul.

Expert system tackles automated project control

Software Productivity Research, Inc., a Cambridge, Mass.-based software measurement firm, is taking software measurement into the final frontier: automated project assessment and control.

A natural extension of its SPQR/20 project measurement tool, Checkpoint automatically predicts software productivity, cost, effort and quality in major software development projects. SPR also claimed a margin of error of +5% or -5% on project cost estimates.

"We are sure of this claim because we are comparing Checkpoint results against data collected from more than 3,000 software projects," explained Ray Falkner, SPR's president and chief executive officer.

Falkner classified Checkpoint as a knowledge-based system. The expert knowledge that drives the system springs from SPR founder and Chairman Capers Jones, who, through 20 years of consulting and measurement research, has accumulated the experience and data.

"While computer-aided software engineering focuses on the software development life cycle, Checkpoint handles the project management side of such undertakings," Jones said.

Checkpoint runs on IBM Personal Computers, Personal Computer XTs and ATs with a hard disk and at least 640K bytes of memory. Jones said that Checkpoint currently has 400 categories of computer languages listed in its system with appropriate Function Point measurement guides for each language. Originally intended to be written in an object-oriented language, Jones said, the 640K-byte barrier on the PC platforms was too restrictive a factor. Checkpoint was written, instead, in C and assembler.

A full range of project reports and graphs is also included, Falkner stated. Checkpoint is priced at $20,000 and is available immediately. — STAN KOLODZIEJ

Circle Reader Service Number 140

Blue Beat

Continued from page 41

with a Personal Computer AT bus. Then there is OS/2 Extended Edition, which is overpriced, unwieldy and oddly consisting of a mass of "bundled" database and communications software.

The jigsaw pieces start to fit into place once users recognize that the 386-based PS/2s are not merely more powerful versions of the Model 50 and 60 but, in fact, implement a different architecture.

For starters, what is the main operating system for the PS/2 Models 70 and 80? PC-DOS 3.3? PC-DOS 4.0? OS/2 Standard Edition? OS/2 Extended Edition? AIX? None of these. All are supported on 386-based PS/2s as an overlay on something called a Virtual Resource Manager (VRM), which is implemented in microcode and is the direct software interface to PS/2 machine hardware. The VRM was originally put together by IBM for the RT Personal Computer and, on that system, is implemented via a dedicated 32-bit reduced instruction set computing (RISC) chip. In this context, the point to note is that AIX is not the RT PC operating system. The VRM is the RT PC operating system. AIX is merely a guest.

In 1983, when the parameters for the PS/2 were being established, IBM went with the VRM. Rather than use a dedicated RISC chip (as in the RT PC), IBM appears to have decided that, for cost reasons and to preserve PC-DOS compatibility, it will use a specialized version of an Intel microprocessor. The

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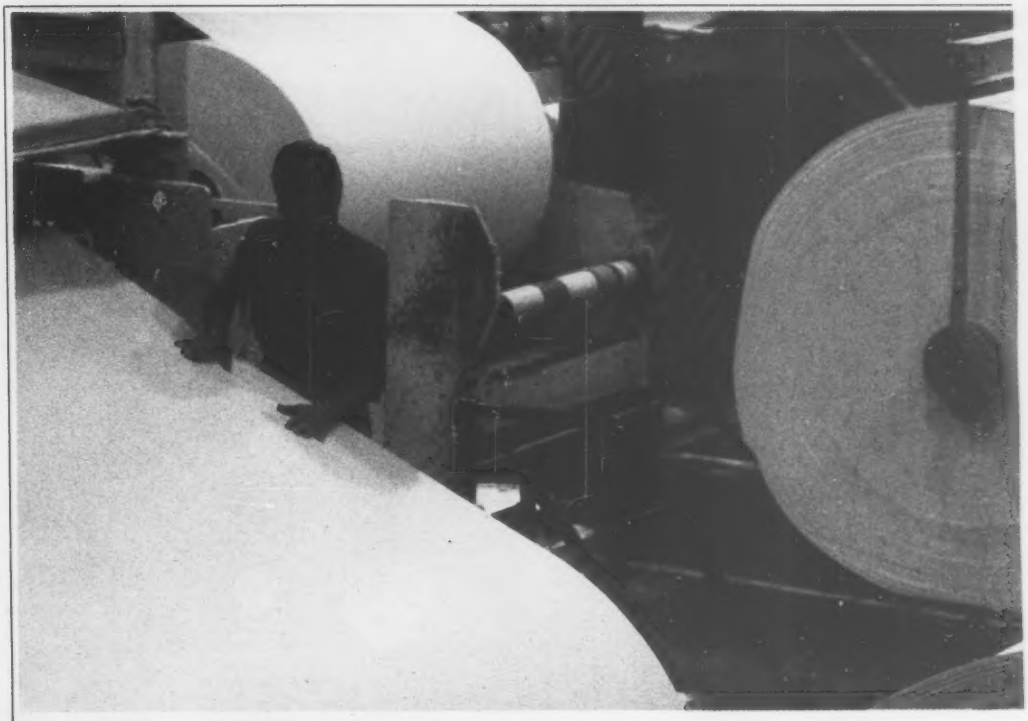

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George Timchal and Tom Cochrane

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TEXAS INSTRUMENTS

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DEC backs Ultrix option

By covering the bases, strategy spurs standards

As successful as it has been with its proprietary VMS operating system, Digital Equipment Corp. does not want to get boxed in. Ultrix, the DEC version of the Unix operating system, has long been available on DEC machines, but the company seems to have given the system a new commitment with a series of recent releases.

The Maynard, Mass.-based firm's goal is to let software developers who want to work under Unix create their products on DEC machines rather than go to another hardware vendor. So it's industry-standard time, here we come.

Topping the list of new software products is Ultrix-32 Version 3.0. This version includes more than 200 commands and utilities and can run more than 1,000 existing software programs, according to the vendor.

Can get at 75G bytes

Ultrix-32 Version 3.0 also offers Ultrix NFS Clusters, enabling as many as 16 devices, such as DEC VAXs and DEC HSC 70 hard-disk drives, to interchange files over a 70M bit/sec. Ethernet network link using Sun Microsystems, Inc.'s Network File System (NFS) protocols. According to DEC, in such an environment, CPUs can share a data base with a memory capacity greater than 75G bytes.

Digital claimed Ultrix-32 complies with all key industry standards, including Posix and AT&T's Unix System V Interface Definition Release II, Volume 1, as well as the base-level specification from the *X/Open Portability Guide.*

Ultrix-32 costs from $2,100 for a Microvax 2000 to $56,058 for a VAX 8820.

DEC also unveiled Ultrix Worksystem Software, which provides an X User Interface (XUI) that works on its major workstations and, according to DEC, is the first implementation of the Decwindows graphics interface program. Including an Ultrix XUI tool kit, a User Interface Library and a programmers' style guide, the Ultrix Worksystem Software costs $1,575 on the Vaxstation 2000 and $3,150 on the Vaxstation II/GPX.

DEC is also offering several products to tie Ultrix and VMS together. The VMS/Ultrix Connection adds the Technical Control Protocol/Internet Protocol and NFS communications packages to VMS to let it talk to Unix machines. DEC said that this product enables a Vaxcluster system to act as an NFS server to Unix-based workstations.

The VMS/Ultrix Connection costs from $7,500 on the Microvax 3600 to $126,000 on the VAX 8978. — MARK BREIBART

Circle Reader Service Number 141

Oracle

Continued from page 41

means it will not run on IBM 3270 terminals in IBM MVS, VM and DOS/VSE operating environments, although the CASE Dictionary does run in those environments.

"That means users can work with Designer on one platform and in one environment and send data to the Dictionary running in another environment," Mollen said. By the end of 1988, Designer should be running on Hewlett-Packard Co. workstations, IBM Personal Computers running the OS/2 operating system and Digital Equipment Corp. VAX workstations.

According to Mollen, pricing for CASE Designer will range from $2,750 to $8,800 per user, depending on the Sun workstation used. A combination of the CASE Dictionary and CASE Designer will range from $6,000 to $10,000 per user, depending on the platform and the number of users. — STAN KOLODZIEJ

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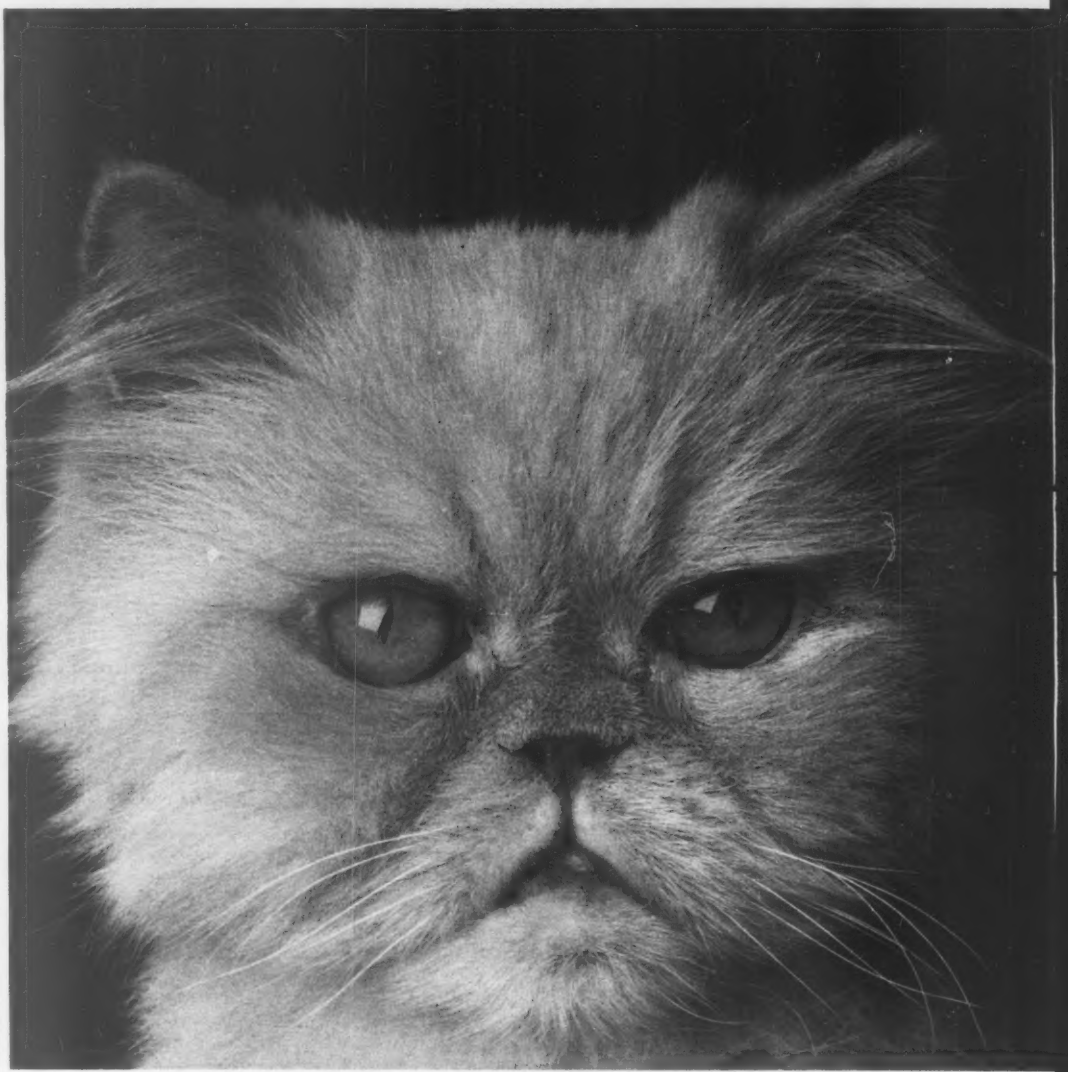

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MCDONNELL DOUGLAS

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Blue Beat

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VRM was embedded in PS/2 Licensed Internal Microcode, which for practical purposes makes it part of the hardware rather than the software.

The VRM is the missing link in the architecture of 386-based PS/2 systems. When it is optimized, it puts an entirely different spin on the role of both the Micro Channel and OS/2 Extended Edition and creates an environment in which some interesting consequences develop, including the following:

- A cluster of PS/2s and/or other IBM systems will operate under a single system image engaged in coprocessing. Coprocessing, it should be noted, extends considerably beyond mere connectivity. It is the execution of a software application as a shared task between multiple processors. In the IBM conception, coprocessing is primarily a vehicle for integrating PS/2s with mainframes, which will handle the bulk of the processing.
- The Micro Channel will act as the manager of local hardware resources within this cluster, while the sum total of the Micro Channels and, for other IBM systems, equivalents act as a single resource management complex within the single system image. The Micro Channel was designed to work in a clustered configuration, not stand-alone.
- OS/2 Extended Edition will become a distributed coprocessing operating system tying together multiple PS/2s and IBM VM, MVS and/or OS/400 systems. The Database Manager component translates into a distributed SQL environment. Except that it is operating in distributed mode, OS/2 Extended Edition becomes functionally similar to OS/400: The relational database management system component and connectivity features are integral parts of the operating system in the same way as they are for the AS/400 line.
- The Token-Ring network will become an integral component of the cluster environment, providing basic 4M bit/sec. transmission services. The relatively high data rate is key to cluster performance under a single-system image. It permits a user on a given system to utilize machine resources on another, physically separated system without significant response time degradation.
- Other operating systems may be guested by the VRM. This is likely to have a major impact when it comes to PC-DOS. Users of IBM PCs will, for example, be able to carry over PC-DOS applications software to PS/2s without having to convert to OS/2. The IBM assumption is that, in the long term, users will want to convert.

In the meantime, however, they can continue running PC-DOS as a single-user operating system while OS/2 Extended Edition looks after clustered coprocessing. Upgrading to PC-DOS 4.0 reduces the interface differences for guested PC-DOS.

No 286s allowed

The caveat to all this is that it only works for 386-based machines. There is a limited subset of functionality for the 286-based Models 50 and 60, but otherwise they rapidly become obsolete. This is what IBM means when it talks about "cascading technology." PS/2 Model 50s and 60s will be obsolete by this time next year.

This should represent a great deal of food for thought for end users debating whether to commit to IBM's Micro Channel PS/2s. It's already becoming very clear that there will, in the future, be few enhancements to the stand-alone capabilities of Micro Channel PS/2s. The vast majority of PS/2 enhancements will be tied to coprocessing. Committing to the new IBM PS/2 standard will mean a nearly irrevocable commitment to IBM's scenario for PC-to-mainframe integration.

It also raises more than a few questions about the extent to which the IBM PS/2 can be cloned. Cloning the Micro Channel is only the beginning of the process. After that, a vendor has to clone a customized and proprietary version of the Intel 386, some coprocessors that will be coming down the line, a set of hardware-embedded microcode, OS/2 Extended Edition in its current and later forms, the advanced version of the Token-Ring network and a mass of software resident on clustered single-system image configurations. By that time, the clone maker is potentially infringing on more than 1,000 IBM patents and copyrights and probably borrowing a lot of IBM's "look and feel" as well. Go ahead, clone. Make IBM's day.

Jeffery is managing director of the International Technology Group, a management consulting and market research firm in Los Altos, Calif.

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COMMENTARY

Tying up loose ends

Jack van Kinsbergen

IBM's Systems Application Architecture (SAA) is an attempt to tie the company's product line together with an architectural layer that sits on top of the operating system, independent of the hardware base. Another way to think of it is as a compatible platform that acts as a bridge between dissimilar hardware products. SAA is calculated to define a consistent standard for system architecture, enabling all IBM systems to talk to each other.

For competitive reasons, IBM has to find a way to homogenize the varied operating systems of its separate products. DEC has achieved enviable success with an all-encompassing architecture that enfolds its entire product line, making inroads in the marketplace against IBM's multiple operating systems.

To counter the erosion around the fringes of its market hegemony, IBM says it plans to implement the four standardized elements of SAA: user visual interface, programmer interface, communications interface and application product offerings.

Before SAA can be implemented in the user community, IBM laboratories will have to get their products running reliably under the new standard. So the first to feel the effects of SAA will be the IBM labs themselves — they will have to conform to global standards that didn't exist before. For products that can't be adapted to SAA, the handwriting is on the wall.

Once IBM reaches the point at which its products have been substantially adapted to SAA, it is liable to start pulling the plug on some of the dissimilar hardware that it no longer wants to maintain.

The 360 analogy

The best analogy for the present-day SAA phenomenon is IBM's 360 system, which the company introduced in 1964.

IBM didn't announce the 360 because it had the marketing foresight to realize that it would lock customers in. Rather, the motivation was sheer practical necessity; Big Blue just couldn't afford to continue servicing its many separate product lines. The cost of servicing separate operating environments for the 1401, 7070, 7080 and 7090 products was rising faster than IBM revenue. To counter the trend, IBM designed the 360 as a compatible product family that would gradually phase out other products, cleaning up IBM's inventory.

In the 24 years since the introduction of the 360, IBM's product line has again become fragmented. Today, IBM has the same diverse clutter of products that was causing problems in 1964, only now these wares are the System/36s, Personal Computers and 3090s. SAA is expected to have the same impact on the marketplace as the 360 did in 1964 — consolidation of a multitude of operating environments during a period of years through a standard architecture.

SAA creates great opportunities and risks for IBM and its competitors.

SAA will make true, distributed data processing possible for the first time within IBM systems, the company claims. This goal could not be accomplished before because the distributed boxes couldn't really talk to one another in the complete sense necessary for effective connectivity.

Once IBM implements the SAA standard, DEC will have the opportunity to port its systems to IBM systems by adopting the standard. What makes it interesting is that this could be either a coup or a debacle from either company's point of view. If DEC tries the option, it could gain a foothold with IBM customers. On the other hand, the plan could easily backfire, and instead of gaining IBM customers, DEC might lose some of its own.

Ironically, it's likely that SAA will prove to be a passing phase in an ongoing, long-term cycle of periodic consolidation and fragmentation in IBM products. There is a powerful tendency for a company in IBM's position to respond to market opportunities during the years with products that don't necessarily fit in the mold set by earlier standards. It will be interesting to see, in years to come, whether IBM is willing and able to maintain consistent adherence to the SAA standard once it is implemented.

What is certain is that SAA will become a reality, just as the 360 did in 1964. Anybody who believes it's not important or it won't happen, doesn't understand the real world. IBM will make it happen.

A 25-year veteran of the computer industry, van Kinsbergen was a member of the design team that pioneered the operating systems for the IBM 360 mainframe. Before joining Boole & Babbage, Inc., where he is now a senior fellow, he advised Citibank on DP issues for the company's consumer banking unit.

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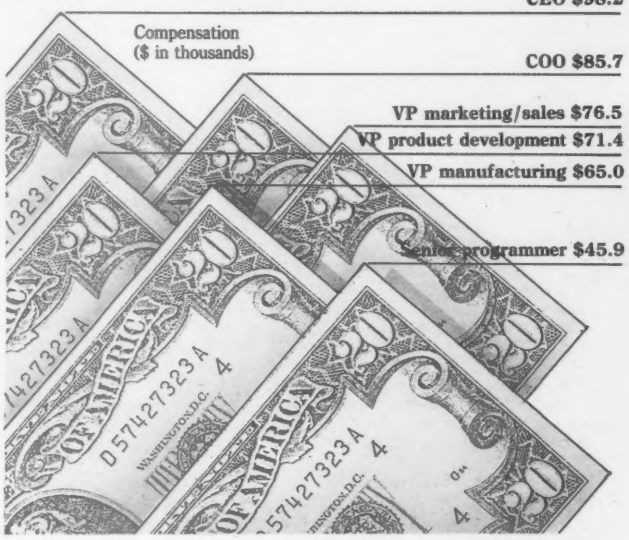

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GRAPHIC BY BRUCE SANDERS

OF INTEREST

"I have been in meetings where we have given the president [of a software company] what we thought was a reasonable schedule. [He] ripped the piece of paper, which had the schedule, in half, and said, 'Here, do it in this time.'"

DAVID MOSKOWITZ
PRODUCTIVITY SOLUTIONS

See story page 10

next issue

PC connectivity is at the heart of November's *Computerworld Focus*. As local-area networks sprout up in the PC environment, they bring not only benefits for users but also related problems for MIS such as security, control and maintenance. We'll weigh these issues and see how the downsizing trend, in which companies use networked micros rather than minis or mainframes, is faring. With an election year at hand, *Focus* will follow lobbying concerns to discover who is championing MIS' welfare. We'll also examine university networks that are finding favor in the commercial sector. In addition to our Special Section on Macintosh-to-IBM PC and -PS/2 links, we will report on MIS's 1989 PC connectivity purchasing plans. So pick up *Focus* — it never hurts to have the right connections.

Get on the users' CASE

Michael D. Millikin

In many areas, it's a little tough to show the productivity payback from automation. In one, it's quite easy: CASE — computer-aided software engineering.

CASE covers a wide spectrum of capabilities, from six-figure systems designed to generate code to $20,000 workstations designed to maintain and upgrade existing code.

Despite a variety of basic approaches from every vendor, certain trends in CASE are evident. There is a move to push more and more capability out on workstations across a distributed network environment, and there is a much greater emphasis on iconic programming.

THE INSIDER

The CASE marketplace, as is everything else in this industry, is being affected by the need for standardization and interchange of reusable code elements between systems. IBM, for one, is being very verbal about the future Systems Application Architecture repositories that will contain such chunks of reusable code.

But before vendors go dashing madly off on that course (which is an important one), there is another crucial need to address: empowering the end user.

To date, most CASE tools are targeted at the professional programmer. One very interesting piece of technology, the Bachman Information Systems, Inc. reengineering product set software, uses an iconic environment to help database administrators cope with the maintenance and improvement of existing data base management system applications. Written in LISP, it runs on an Intel 80386-based personal computer with 12M bytes of memory and a high-resolution screen.

The Bachman line relies upon graphics to extract the existing DBMS' structure to the conceptual level of design and then enables restructuring and updates. Unfortunately, this is still a tool for the DP professional.

At the same time, however, user-developed applications are becoming more critical to the success of a company. No matter how many turbocharged CASE stations appear on DP desks, MIS alone cannot whittle away at the applications backlog. Users will increasingly bear the brunt of cranking out the task-specific line-of-business applications that will give their companies an edge.

Yet these same users are the ones without CASE tools to make their jobs easier.

The idea is not to turn everyone into a professional programmer. The idea is to give users a task-oriented icon-based system that supports a fairly sophisticated level of application generation through the direct manipulation of icons representing reusable code.

Users don't need further distraction from their business tasks at hand. But users do need to be able to generate applications to help them deal with those tasks and problems. The solution is available. Vendors, get on the users' CASE.

Millikin is vice-president and senior analyst with Patricia Seybold's Office Computing Group in Boston.

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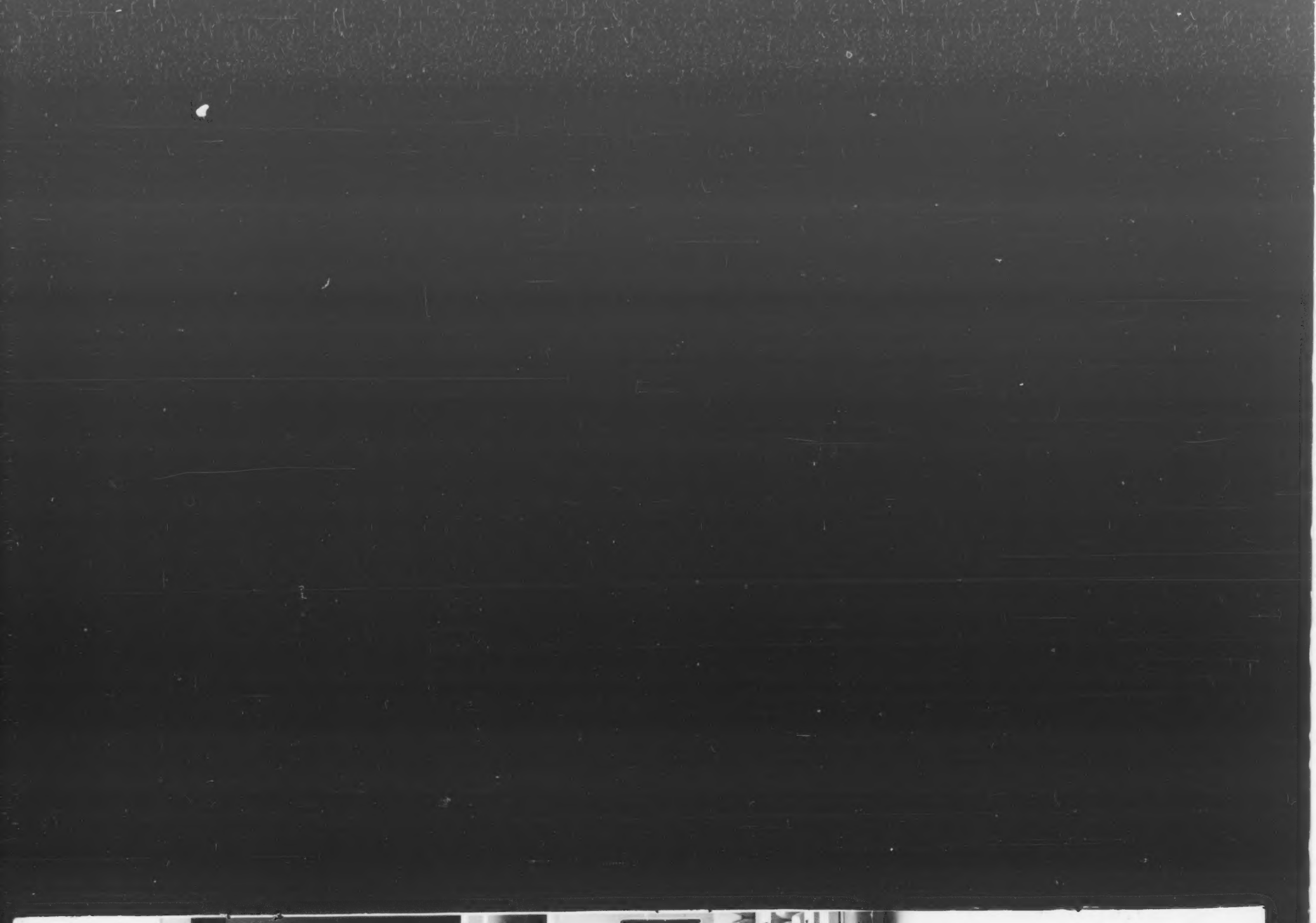
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